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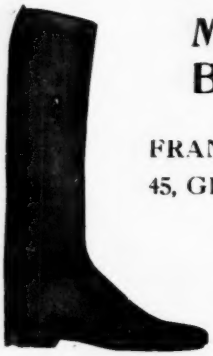

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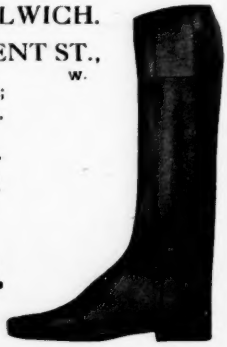

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CONTENTS FOR DECEMBER, 1912.

1. MARSHAL NEY. "THE BRAVEST OF THE BRAVE" ... ... *Frontispiece*
2. SECRETARY'S NOTES 1643
3. PRINCIPAL ADDITIONS TO LIBRARY 1646
4. THE EMPLOYMENT OF WAR DOGS, WITH SPECIAL REFERENCE TO TRIPOLI AND OTHER RECENT CAMPAIGNS. BY MAJOR C. H. RICHARDSON 1649
5. NAVAL AND MILITARY CALENDAR 1664
6. MILITARY CRYPTOGRAPHY. BY CAPTAIN M. MUIRHEAD, R.F.A. 1665
7. SOME ENVIRONMENTAL FACTORS IN RELATION TO DISEASE AFLOAT. BY FLEET-SURGEON C. MARSH BEADNELL, R.N. ... 1679
8. COURTS MARTIAL OF THE PENINSULAR WAR, 1809-14. BY PROFESSOR C. W. OMAN 1699
9. THE VON LÖBELL REPORTS ON MILITARY MATTERS IN 1911. PRÉCIS FROM THE GERMAN BY LIEUT.-COLONEL E. GUNTER 1717
10. THE ACTION OF TIDE-GENERATING FORCE. BY J RUTHVEN, ESQ. 1732
11. RECOLLECTIONS IN PORTUGAL AND SPAIN DURING 1811 AND 1812. BY CORNET FRANCIS HALL, 14th Light Dragoons ... 1735
12. THE WAR IN THE BALKAN PENINSULA. (A) Military Operations; (B) Naval Operations; (C) Political. 1740
13. NAVAL NOTES. *British Empire. Home:*—Appointments; Movements of Ships; New Ships; Gift of Ship by Malay States. *Canada:*—Naval Defence Requirements; Gift of Ships. *France:*—Appointments; Launch of the "France"; Steam Trials; Accident

Continued on Page 3.

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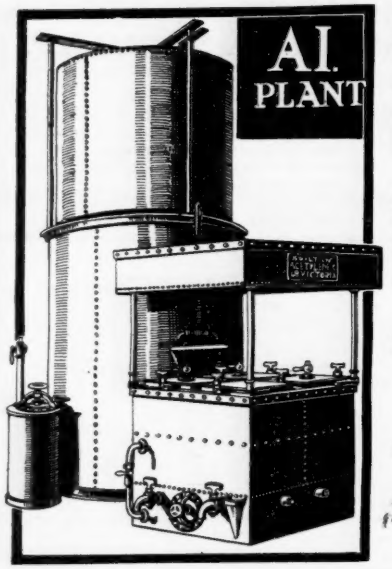

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CONTENTS—continued from page 1.

on the "Jules Michelet." *Holland:*—Shipping; Wireless Telegraphy. *Italy:*—Review of Fleet; Steam Trials; Report of Minister of Marine. *Norway:*—Naval and Coast Defence Programme. *Russia:*—Torpedo Range; Shipbuilding Bounties; Trophy of 1854. *Servia:*—Port on the Danube. *United States:*—Dock at Hawaii; Ammunition Contracts 1750

14. MILITARY NOTES. *British Empire. Home:*—Strength of Territorial Force. *Afghanistan:*—Railways. *India:*—Abor Expedition; Chinese troops from Tibet. *Austria-Hungary:*—Army Estimates; *Belgium:*—Army Estimates; Appointments; Resignations; Army Re-organization. *China:*—Review in Pekin; Finance; Railways; Tibet. *France:*—Anti-Militarism; New Uniform. *French Colonies:*—Wireless Telegraphy; West Africa; Algeria; Guineé; Equatorial Africa. *Morocco:*—General Situation; Operations; Port of Casablanca. *Germany:*—Obituary; Martial Law in Bavaria; Army Estimates for 1913. *Holland:*—Army Re-organization; Uniform. *Italy:*—Finance; Cost of War; Motor Census; Machine-guns. *Italian Colonies:*—Creation of Colonial Office; Pacification of Libya. *Mexico:*—Rebellion. *Nicaragua:*—End of Rebellion. *Persia:*—Railways; Turco-Persian frontier; Shahsevans. *Russia:*—Finance; War Indemnity; Mongolia; Military Preparations; Obituary. *Spain:*—Franco-Spanish Treaty. *Spanish Colonial Africa* 1763

15. AERONAUTICAL NOTES. *British Empire. Home:*—Biplane for Australia. *France:*—Wreck of "Adjutant Vincenot"; Aircraft fund; Aeroplanes in Marocco. *Germany:*—Dirigibles; Reported flight over Sheerness; Aviation Fund; Airship Sheds; Regulations for Aviators; Number of Pilots. *Italy:* Course for Pilots; Hydro-aeroplane Stations; Purchase of Aeroplanes. *Russia:*—Aeroplanes; Dirigibles. *Spain:*—Aviation Tests 1775

16. NOTICES OF BOOKS 1777

17. CONTENTS OF FOREIGN PERIODICALS 1782

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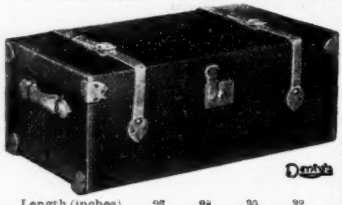

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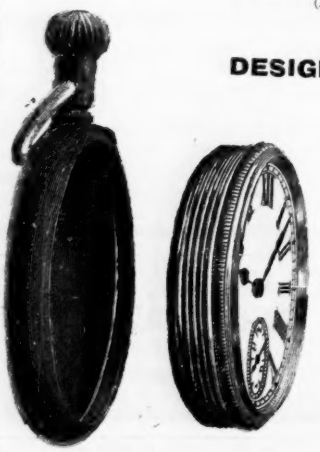

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ERRATUM

In the narrative of the Balkan War in the JOURNAL for November, 1912, page 1625, twentieth line from foot of page, for "First" read "Second." The line will then read "On the 18th October the Second Army crossed the frontier, etc."

ROYAL UNITED SERVICE INSTITUTION.

DECEMBER, 1912.

SECRETARY'S NOTES.

I.—NEW MEMBERS.

The following officers joined the Institution during the month of November :—

Lieutenant P. J. Egerton, Border Regiment.
Colonel C. W. F. Whyte, I.A.
Lieut.-Colonel H. Parkin, C.I.E., I.A.
Captain L. J. N. Neville, R.E.
Lieutenant H. S. H. Ellis, R.N.
Lieutenant R. W. Awdry, Royal Wiltshire Yeomanry.
Captain N.P. Clarke, Royal Dublin Fusiliers.
Captain H. P. Torrens, East Surrey Regiment.
Lieutenant R. J. R. Scott, R.N.
Sub-Lieutenant H. G. Gorton, R.N.
Engineer-Commander C. C. Sheen, R.N.
Captain E. M. Jack, R.E.
Captain F. S. Rose, 10th Royal Hussars.
Lieut.-Colonel R. L. Aspinall, D.S.O., 3rd Bn. Yorkshire Regiment.

II.—GOLD MEDAL ESSAY, 1912.

The following additional Essays have been received :—

(6) "The old trail and the new."
(7) "It is the Navy, whereon, under the good providence of God, the wealth, safety, and strength of the Kingdom chiefly depend."
(8) "The greatest of British interests is peace."
(9) "Videant Consules."
(10) "Appetitus rationi pareat."
(11) "Semper paratus."
(12) "To fear the foe, since fear oppresseth strength, gives in your weakness strength unto your foe."

III.—GOLD MEDAL ESSAY (Military) for 1913.

The following subject has been selected by the Council for the Essay for 1913:—

"An examination of the requirements of modern war shows that not only are numbers . . . . necessary, but also . . . . moral qualities developed as highly as possible in each individual according to his rank."—Extract from *Training and Manœuvre Regulations*, Sect. 1 (2).

How can moral qualities best be developed during the preparation of the officer and the man for the duties each will carry out in war?

IV.—LECTURES.

Members desiring to deliver Lectures in the Theatre, or contribute Papers to the JOURNAL, are requested to submit them for perusal of the Council through the Secretary. The Council specially hope that they may receive offers of Lectures on Naval Subjects.

V.—REGIMENTAL COLOURS.

The Institution is prepared to arrange at the Institution for the repairs to Regimental Colours and Cavalry Standards, in service or otherwise, and in future there will be no more delay than necessary, in executing the work, the staff having been augmented; a very large number have been received during the past year. Enquiries having been made as to the cost of such repairs, the Secretary begs to state that the average cost is about £4 a colour, of which the Institution only receives 10s. to cover the cost of materials, carriage, etc.

VI.—CHANGE OF RANK AND ADDRESS.

The attention of Members is called to the necessity for communicating any changes of rank or address to the Secretary. It is essential that such notification should be made in writing, and only *one* change of address can be registered each month. The 9th day of the month is the last day on which such change can be notified in order to take effect for the delivery of the JOURNAL of the current month. If such changes are not notified, Members themselves will be responsible if their JOURNALS fail to reach them through being wrongly addressed, and officers are requested to write their name, with initials, distinctly on such communications. Several signatures have recently been received which it has been impossible to decipher, and as there are many instances of Members bearing the same name and initials, it is requested, therefore, that they will add their rank. The Council beg to draw the attention of Members, who do not have the JOURNAL sent to them, and have not registered an address with the Secretary, to the fact, that they (the Council) cannot be held responsible if such Members do not receive any notices that may from time to time be sent out.

VII.—LETTERS.

Members are reminded that the Council can accept no responsibility in the matter of letters and telegrams addressed to them at the Institution, and no arrangements are made for the forwarding of Members' letters.

VIII.—ADDITIONS TO THE MUSEUM.

(6508). Cartoon by the celebrated Dutch sea-painter, William Vandevelde, the younger, for his picture representing the opening fight of the four days' battle (June 1st-4th, 1666) between the English fleet, under the joint command of Prince Rupert and the Duke of Albemarle, and the Dutch fleet, under De Ruijter.

The English fleet was numerically considerably inferior to the Dutch, and although beaten, the battle was practically a drawn one, as the Dutch were unable or failed to follow their victory up.

(6509). The following Medals presented by H.M. King George V.

(23) Queen Victoria's Jubilee Medal of 1887.
(24) Queen Victoria's Diamond Jubilee Medal of 1897.
(25) King Edward VII. Coronation Medal, 1902.
(26) King George V. Coronation Medal, 1911.
(27) The Royal Victorian Medal issued by H.M. Queen Victoria.
(28) The Royal Victorian Medal issued by H.M. King Edward VII.
(29) The Royal Victorian Medal issued by H.M. King George V.

(6510). Silver Medal of the Shipwrecked Fishermen and Mariners Royal Benevolent Society, new pattern.—Given by the Council of that society.

(6511). A Ju-Ju Figure from West Africa. This figure was taken by the donor while serving with the 1st Bn. Northern Nigerian Regiment, on a punitive expedition against the Munshis, a cannibal Pagan tribe of Northern Nigeria, in 1905. The figure was in a Ju-Ju house, and had recently been the object of human sacrifice.—Given by Captain C. F. Thornton.

(6512). Uniform Tunic of the Orange Free State Artillery.—Given by H. Lehmann, Esq.

(6513 & 6514). Infantry officer's Cocked Hat and Epaulette of about 1800. They formerly belonged to Colonel Pearce of the Andover Loyal Volunteers.

(6515). Officer's Belt-Buckle, Royal Artillery, about 1828.—Given by Museum Attendant, T. E. Simpson.

(6516). Code of Army Signals issued for the use of General Whitelock's disastrous expedition to Buenos Ayres in 1807. This officer proved a most incapable leader, and was forced to surrender and evacuate the whole of the River Plate region.—Given by Capt. H. P. Torrens, East Surrey Regiment.

PRINCIPAL ADDITIONS TO LIBRARY.

November, 1912.

Can Germany Invade England? By Colonel H. B. Hanna. Crown 8vo. 1s. (Presented by the Author.) (Methuen & Co.). London, 1912.

La Politique Boer—Faits et documents en réponse au Docteur Kuyper. By Yves Guyot. Crown 8vo. (Presented by Lieut.-Colonel R. H. Carr-Ellison.) (Kügelmann). Paris, 1900.

Une erreur judiciaire—L'Affaire Dreyfus. By Bernard Lazare. 8vo. (Presented by Lieut.-Colonel R. H. Carr-Ellison.) (P. V. Stock). Paris, 1897.

La Chute de Rabah. By Emile Gentil. 8vo. Illustrated. (Presented by Lieut.-Colonel R. H. Carr-Ellison). (Hachette et Cie.). Paris, 1902.

Le 3e Régiment de Chasseurs d'Afrique. By General de Forsanz. 8vo. Illustrated. (Presented by Lieut.-Colonel R. H. Carr-Ellison). (Berger-Levrault et Cie.). Paris, 1898.

Histoire Critique et Militaire des Guerres de Frédéric II. By General Baron Jomini. New Edition. 8vo. (Presented by Lieut.-Colonel R. H. Carr-Ellison). (J. B. Moens). Brussels, 1814.

Précis de l'Art de la Guerre, ou nouveau traité Analytique des principaux Combinaisons de la Stratégie de la grande tactique et de la politique Militaire. By General Baron Jomini. New Edition. 8vo. (Presented by Lieut.-Colonel R. H. Carr-Ellison). (J. B. Moens). Brussels, 1837.

Mazedonien—Eine Militär-politische Studie. 8vo. 11d. (L. W. Seidel & Sohn). Vienna, 1905.

Die Œstliche Balkan-Halbinsel, Militär-geographisch, statistisch und Kriegs-Historisch. By Lieut.-Colonel Anton Tuma. 8vo. 3s. 7d. (Carl Gerold's Sohn). Vienna. 1886.

Sixty Years of a Soldier's Life. By Major-General Sir A. E. Turner. 8vo. 12s. 6d. (Methuen & Co., Ltd.). London, 1912.

The Strangling of Persia. By W. Morgan Shuster. 8vo. 12s. 6d. Illustrated. (T. Fisher Unwin). London, 1912.

Campaigns of a War Correspondent. By Melton Prior. 8vo. 15s. Illustrated. (Edward Ernold). London, 1912.

Marshal Ney, the Bravest of the Brave. By A. Hilliard Atteridge. 8vo. 10s. 6d. Illustrated. (Methuen & Co., Ltd.). London, 1912.

The Abor Jungles, being an account of the Abor Expedition, the Mishmi Mission and the Miri Mission. By Angus Hamilton. 8vo. 18s. Illustrated. (Eveleigh Nash). London, 1912.

The British Battle Fleet, its Inception and Growth throughout the Centuries. By F. T. Jane. 8vo. 21s. Illustrated. (S. W. Partridge & Co., Ltd.). London, 1912.

The Balkan Trouble, or an Observer in the Near East. By W. Le Queux. 8vo. 16s. Illustrated. (Eveleigh Nash). London, 1912.

Empires of the Far East—A Study of Japan and of her Commercial Possessions, of China and Manchuria, and of the Political Questions of Eastern Asia and the Pacific. By Lancelot Lawton. 2 Vols. 8vo. 30s. (Grant, Richards, Ltd.). London, 1912.

A Biographical Memoir of His Late Royal Highness Frederick, Duke of York and Albany, Commander-in-Chief of the Forces of Great Britain, etc. By John Walkins. 8vo. 6s. (Henry Fisher, Son & Co.). London, 1827.

Contraband of War. By Lieutenant W. A. E. Egerton, R.N. 12mo. 1s. 6d. (J. Griffin & Co.). Portsmouth, 1909.

A Curtailed Memoir of Incidents and Occurrences in the Life of John Surman Carden, Vice-Admiral in the British Navy. Written by himself, 1850; now first printed and edited by C. T. Atkinson. 8vo. 10s. 6d. (Presented by the Delegates of the Clarendon Press). (Clarendon Press). Oxford, 1912.

La Bataille du Mans. By D. Mallet. Crown 8vo. 4s. (E. Champion). Le Mans, 1873.

How to Play the "Naval War Game." By Fred. T. Jane. Oblong 8vo. Illustrated. (Presented by the Author). (Sampson Low, Marston & Co., Ltd.). London, 1912.

Military History for Examinations—Questions on the Bohemian Campaign of 1866. By Lieut.-Colonel H. M. E. Brunker. Crown 8vo. 1s. 6d. (Presented by the Publishers). (Forster, Groom & Co., Ltd.). London, 1912.

The Campaign in Alsace, August, 1870. By Brig.-General J. P. Du Cane. 8vo. 5s. (Presented by the Publishers). (Hugh Rees, Ltd.). London, 1912.

The Roll of the Officers of the 101st and the 104th Fusiliers and the Royal Munster Fusiliers. By Lieut.-Colonel S. T. Banning. 8vo. (Presented by the Author). (Spottiswoode & Co., Ltd.). London, 1912.

Feldbefestigung. By Captain W. Stavenhagen. 8vo. (Presented by the Publishers). (E. S. Mittler und Sohn). Berlin, 1912.

The Highland Conscript, or Thirty-four Years in Asia. By M.M.M. Crown 8vo. 3s. 6d. (Kegan Paul, Trench, Trübner & Co., Ltd.). London, 1912.

The France of Joan of Arc. By Lieut.-Colonel A. C. P. Haggard. 8vo. 7s. Illustrated. (Stanley Paul & Co.). London, n.d.

Oil-Finding, an Introduction to the Geological Study of Petroleum. By E. H. Cunningham Craig, with an introduction by Sir Boverton Redwood. 8vo. 8s. 6d. Illustrated. (Edward Arnold). London, 1912.

The Russian Oil Fields and Petroleum Industry. By John Mitzakis. 8vo. 3s. 6d. (The Pall Mall Press). London, 1911.

Rifle, Rod and Spear in the East. By Sir Edward Durand. 8vo. 5s. Illustrated. (John Murray). London, 1911.

Vedic Index of Names and Subjects (Indian Texts Series). By A. A. Macdonell & A. B. Keith. 2 vols. 8vo. 24s. (John Murray). London, 1912.

Britain's Imminent Danger. By H. F. Wyatt and L. G. H. Horton-Smith. 8vo. (Presented by Authors) (Imperial Maritime League). London, 1912.

Some Memories of my Spare Time. By General the Rt. Hon. Sir Henry Brackenbury. Crown 8vo. 1s. 6d. (William Blackwood & Sons). Edinburgh and London, 1909.

Vade Mecum for Officers and Civilians proceeding to India. By Lieut. J. E. Power, I.A. 12mo. 1s. 6d. (Presented by Publishers) (Forster Groom & Co., Ltd.). London, 1912.

Histoire de la Guerre Italo-Turque, 1911—1912. Par un Temoin. 8vo. 1s. 11d. (Berger-Levrault). Paris, 1912.

Armaments and Arbitration. By Capt. A. T. Mahan, U.S.N. 8vo. 6s. (Harper & Brothers). New York, 1912.

The Personality of Napoleon. By J. Holland Rose. Crown 8vo. 5s. (G. Bell & Sons, Ltd.). London, 1912.

On the Track of the Abor. By Powell Millington. Crown 8vo. 3s. 6d. (Smith, Elder & Co.). London, 1912.

Panama and the Canal To-day. By Forbes Lindsay. New and revised edition. 8vo. 12s. 6d. Illustrated. (Sampson Low, Marston & Co., Ltd.). London, 1912.

Napoleon's Last Campaign in Germany, 1813. By F. Loraine Petre. 8vo. 12s. 6d. (John Lane). London, 1912.

THE JOURNAL
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ROYAL UNITED SERVICE INSTITUTION.

VOL. LVI. DECEMBER, 1912. No. 418.

[Authors alone are responsible for the contents of their respective Papers.]

THE EMPLOYMENT OF WAR DOGS, WITH SPECIAL REFERENCE TO TRIPOLI AND OTHER RECENT CAMPAIGNS.

By MAJOR C. H. RICHARDSON, late Wilts and Derbyshire Regt.

On Wednesday, 30th October, 1912.

BRIG.-GENERAL R. C. B. HAKING, C.B., in the Chair.

IT was with great pleasure that I received the invitation of the Royal United Service Institution to speak on a subject which has been my especial study for close on 20 years. It might be of interest to you to know how I had my attention called to the subject. I had always been interested in the training of dogs for useful purposes, and when one morning years ago, when out shooting on a friend's moor in Scotland, I noticed a foreigner negotiating the purchase of a sheep dog from one of the shepherds, and making experiments therewith I at once made enquiry. I found that the man was an agent of a foreign government, sent over to buy suitable dogs for use in connection with their army.

From that time I commenced a systematic study of the training of dogs for use with our soldiers and police. In this lecture I shall only speak on the military dogs. It has always seemed strange to me that the extraordinary qualifications of the dog in this particular relation should have been so overlooked in this country.

The erect position of man and his dependence on his sense of sight has caused his hearing powers to deteriorate, while his olfactory organs, compared to those of the dog, are quite rudimentary, although certain primitive tribes, such as the Puongs of Cambodia, the Ainus of Japan, and the Aborigines of Peru, still possess the sense of scent, and can distinguish

in the thickest woods between the approach of one of their own race, a white man or a negro.

The position of the dog near to the ground, and the increased size of the tympanum of his ear, enable him to hear sounds unheard by civilized man; while his sense of scent, his intelligence and loyalty, his homing instinct, and his tireless watchfulness, are qualities which cannot be estimated too highly for service with the soldier.

HISTORICAL.

In searching into the past history of the world, we find that several great generals believed in canine aid. Cæsar used dogs to guard his camps, and Frederick the Great also caused his sentries to employ them. Napoleon wrote to Marmont on June 21st, 1799, "They ought to have with them at Alexandria a large number of dogs, which should be fastened a short distance from the walls." They were used in the Civil War of North and South America as sentries and for tracking work, and also in the Russo-Turkish War of 1878. During the Franco-German War they were used by individual people, and very often with great success, but it is only of recent years, owing greatly to the changing conditions of warfare, that the subject has received scientific attention.

The duties of the modern military dog can be divided into three sections:—

1. As a scout or sentry.
2. As an aid to the ambulance in looking for the wounded.
3. As a messenger and ammunition carrier.

I have mentioned these services in the order in which I consider they rank in value, and will speak on the sentry and scout dog first.

SCOUT DOGS.

The development of modern firearms will demand increased means for discovering the intentions of the enemy, as attacks are either carried out or the troops moved into position for them more or less in the darkness, the preparatory marching up of the troops for the attack or defence being carried on under cover of night. Here it is that the watchful and tireless sentry dog attached to the front line of outposts will find his chief value.

With the descent of darkness, which renders the human being so helpless, the hearing or scenting powers of the dog become most acute, and where the soldier may often have his senses dulled by fatigue after a long march or arduous campaign, or even where he may be misled by nervousness to hear sounds that exist only in his imagination, the dog will be found tirelessly wakeful and alert, and acutely sensitive to all scents

and sounds. He will hear or wind the stealthy approach of the patrols of the enemy long before the sentry is aware of there being anyone in the neighbourhood.

After hundreds of experiments I have proved that a dog can hear 200 to 400 yards further than a man, and where wind or atmosphere are especially favourable for scenting as well, detection will come at far greater distances.

At all suspicious noises he will show restlessness, and will make the sentries more watchful and keener in their observations. Not only is the sentry dog of use in front, but also for guarding communications in the rear, such as bridges, tunnels, and columns bringing up provisions. It is my firm opinion that the efficiency of scouts and sentries would be enormously increased were they provided with properly trained dogs, and the appalling results due to rushes and ambuscades would be reduced to a minimum.

The least number a regiment should have, in order to be properly safeguarded, is 12 dogs, and where in time of war the service lies in very enclosed dangerous country, this number should be increased. When on the march, the advance and flank guards should have dogs, and at the bivouac these should be distributed among the sentries, while when troops are intrenched, the dogs can be placed on guard in the trenches or in front of the wire entanglements.

AMBULANCE DOGS.

To pass on to the ambulance dogs—another point that has been emphasized in recent warfare is the increasingly difficult conditions under which the collection of the wounded is carried on.

The Medical-Inspector Czernicki, of the French Army, wrote these lines: "On August 19th, 1870, I found in searching the battlefield of Rezonville, Gravelotte, two of the Lepasset Mixed Brigade who had fallen wounded on August 16th, that is three days previously—hidden at about a distance of 300 metres from each other in some excavations at the edge of the wood in the Gorze ravine. They had not seen a living person from the moment they fell, though the field had been overrun by the belligerents and searched by ambulance men."

During the Russo-Japanese War the battles sometimes lasted eight to ten days, and it was only possible to go to the relief of the wounded at night during the darkness, when there was perforce a lull in the firing. Even then the search had to be made without lights, as these drew the enemy's fire, and it is appalling to think of the sufferings of the unfortunate wounded men, driven by raking shell fire to take every possible cover, lying sometimes quite close to their would-be rescuers and quite unable to cry out while hearing the footsteps of the succouring party recede into the distance.

In Manchuria, Madame X, attached during the whole of the Russo-Japanese War to the Red Cross Service, expresses herself in the following terms: "Less fortunate were those who were rendered motionless by their wounds. For want of removal many died where they lay of hæmorrhage, exhaustion, and cold."

Major Matignon, of the French Army, attached to the Japanese, in a private letter to a friend says: "One morning about 10 o'clock I saw a wounded Russian arrive at the field hospital, No. 3 of the 5th Division, borne by two Japanese regimental ambulance men. The thermometer stood at this moment at 10 below zero. Interrogated by one of our interpreters, he informed us that he had just passed 36 hours on the field of battle. He had been found in a hollow roadway where he had fallen unconscious while endeavouring to gain the Russian first aid post. He had not been observed by the Russians at the moment of their retreat."

There were a few trained dogs which were presented to the Russian Red Cross from Germany and England.

Count Persidsky, of Count Keller's staff, writes: "In finding the missing and wounded, with which the millet fields are strewn, nothing succeeded like our pack of seven dogs. The English ones are especially intelligent. In our last engagement 23 men were found in unsuspected places."

The medical records of the South African War go to show the impossibility often of reaching the wounded until night time, and the difficulty of finding the men in the darkness, searchlights being impossible.

Dogs in this connection are of immense service, and the darkness and increased moisture in the air, and the smell of blood all makes their tracking work the easier.

They may not be so often called upon for this duty as for scouting or sentry work, but at times this will be equally important.

These should go out ahead or on long leads with the searchers and stretcher bearers, and they will be a great assistance in identifying the wounded.

MESSENGER AND AMMUNITION DOGS.

The third and last duty of the dog is as a messenger or ammunition carrier, and I have put this last as it is by far the most difficult for the dog to learn. Where his training as a scout or sentry is a question of merely cultivating and bringing to a high state of perfection those qualities which are more or less inherent in him; that of a messenger partakes more of the trick training, and where he will know his environment quite sufficiently to be efficient in his first two duties, he will require a much longer time to become proficient in this last one.

That dogs can do this is the case. A correspondent who was with the Boxer Expedition wrote of the dogs which accompanied the German artillery that it was always delightful and interesting to watch their movements. Upon one occasion where it became necessary to shell a Chinese patrol, the orders were brought by a dog five miles in a few minutes, and the dog was standing quietly by as the guns galloped up. For carrying ammunition to the firing line dogs would be extremely valuable as offering a smaller and more quickly moving target for the enemy's fire, but here again is required a very careful and technical training, which can only be done where the dog is actually among the soldiers, and thoroughly at home in his environment.

I should like to point out that it is quite a mistake to think that in time of war a number of dogs suitable for military service could be quickly obtained—nothing can be more emphatically denied. My own experience is that out of over 20 likely-looking specimens only one will turn out worth the training. I shall speak later of the use that has been made of dogs in recent campaigns, but I will here say that the successes have been with those which have been carefully trained in peace time, and the failures with those hurriedly collected at the last moment, and without training.

In selecting a suitable dog many things have got to be taken into consideration. Intelligence, acuteness of hearing and scenting are of first importance. Natural biddableness is also essential. Too heavily coated a dog is not advisable, as these feel the heat in hot climates, and are difficult to keep free from insects.

Where large numbers are required, the purchase money must not be high, and expensive breeds are useless. After years of experiments with every sort of breed, I have found that the Airedale proves about the best of all those we have in this country. He is faithful and intelligent, and possesses all the qualities of scenting and hearing required; his coat, while not too heavy, is sufficiently so to be weather resisting, and he is of a good size, as he is not big enough to be too easily fatigued, and yet he is tall enough for going through the long grass, etc. Furthermore, he is extremely hardy. Former inmates of my kennel are serving with troops or police in all parts of the world, and from both cold and tropical climates I hear good accounts of their health. There are few breeds of which this could be said. I frequently use various crosses, but the Airedale is the basis of my breed.

RECENT CAMPAIGNS.

I will now mention some recent campaigns where dogs have been and are being used at the present time.

In the war in Cuba, Captain Steel, of the American Cavalry, used a dog called "Don," and he asserted that it was owing

to this dog's service that no detachment with which it went was ever ambuscaded. He says: "Dogs are the only scouts that can secure a small detachment against ambuscade in these tropical jungles. The bush is so dense and the trails are so crooked and over such rough territory that the leading man at one or two hundred yards is out of sight of the main party. The insurgents lying in ambush often let the leading man pass by and open with a volley upon the wagons and main party of the escort."

This dog Don went through the entire campaign; lived for more than a month on scraps of bread and bacon, and during a day covered six times as much ground as any man of the column.

In the Russo-Japanese War the entire trans-Siberian railroad was guarded by dogs, and to their aid greatly may be ascribed the reason that it was never cut.

I have already mentioned the services rendered to the ambulance in this war, and I may add that the Japanese often used dogs as scouts on long leads.

In the German South-West African War the mistake was made of hurriedly collecting large numbers of dogs at the last minute, and sending them with the troops. These were, in most cases, without any training, and were selected by insufficiently experienced persons, so that many were quite unsuitable for the work and climate. Those which were properly trained and handled gave good results, and Sergeant Kranholt gives his experiences as follows:—

"At the outbreak of the disturbances in South-West Africa I was serving as sergeant of police at Eisleben. I was called up as a reservist and posted to the 1st Regiment of Field Force. By order of the War Office I took two dogs, one of which I had for police duty and another the present of the German Sheepdog Society." These, of course, would be highly-trained dogs. "After landing at Swakopmund, I was sent with the dogs immediately to the interior.

"In spite of the long journey, want of exercise, change of climate, long periods of want of water, the stony ground and sharp grass, my dogs were, with the exception of a few days, always fresh and ready for work, and always on the alert. The opposite happened with other breeds which were employed for service. The majority had the pads of their feet cut after the first few marches, and had to be put in luggage wagons. I handed over one to First-Lieutenant Bahr of the 10th Dragoons, whose duty it was to clear the country of straggling Herreros. This dog accompanied him in all his expeditions, and proved himself entirely reliable and useful, and was always in good health.

"As sentries the dogs did excellent work in occupied posts, at wells, cattle posts and such like, and prevented many surprises and stealing of cattle.

"It must be absolutely laid down that dogs' feet are absolutely hard, and that they are accustomed to work all day, otherwise they are useless."

Captain Hinsh, Headquarters Staff, reports his dogs are a great protection to the column to which he is attached. Lieutenant V. Doring, 19th Dragoons, in the same campaign, also stated his dogs have given excellent results on patrol, in action, and in camp and on the march.

ABOR CAMPAIGN.

It was owing to the initiative of a lady that a pair of dogs accompanied the force sent against the Abors last winter. Mrs. Alban Wilson, wife of Major Alban Wilson, of the 8th Gurkhas, obtained permission from the commanding officer and from the general commanding the expedition, to present two dogs, purchased from me, to her husband's regiment. "Bob" and "Jumbo" were late in getting out to India, and were only just in time to catch the regiment before it began its march, and they were therefore completely strange to climate and men, and had also had a most terribly trying voyage in the hottest season of the year. They settled to their work, however, and the correspondent with the expedition sent the following dispatch, which appeared in the London Press on November 11th, 1911:—

"Before the encounter of November 7th, one of the dogs accompanying the advanced guard gave timely warning of the presence of Abors. The dogs are also employed at night time, being used by the Gurkha sentries, who keep them on a chain to supplement their own vigilance."

On another occasion the dispatch sent was as follows:—

"The expedition has now reached Rotung, a gathering place of the Abors, which was found to have been burned. After marching unopposed to the limit of the made road, the striking force began the ascent of the rising ground beyond the Lelek river, through a thick bamboo forest.

"Information had been received to the effect that a stockade might be met with, and the Gurkha scouts, who were accompanied by Major Richardson's war dogs, were accordingly ordered to keep a sharp lookout. The dogs again proved their efficiency, as they gave warning to the outposts of the presence of the enemy's scouts before they were seen by the Naga coolies."

In a private letter written to me by Major Wilson, under whose supervision the dogs were on the march, he says: "My dogs never once failed to give notice of an enemy on the path, with the result that the advance guard or main body was never ambuscaded."

At the time these dogs were on their march through the Indian jungles, the Turco-Italian War broke out, and I went out to Tripoli to study the war from my particular point of view. I at once saw the immense advantage to be gained by having the trenches and outposts guarded by dogs against night attacks. Returning to Rome, I represented this at the War Office, and the idea was adopted, and large numbers of dogs were sent out. At the moment of writing there are over 500 dogs at the seat of the war. The Italian Army had no trained dogs except a few stationed in some of the forts, but fortunately they were able to obtain those belonging to the Customs House officers, which were kept to prevent smuggling on the Austrian frontiers. These were well trained, and were sent with their keepers, who thoroughly understood their handling, so that excellent service was rendered. These dogs were of the Ristone or Spinone breed, with a good deal of cross in them. They are of medium size of black or brown colour, and with silky hair, and are very intelligent and have excellent noses. They were used with the cavalry as scouts for tracking out hidden Arabs in the oasis, and as aids to the nocturnal guards and advanced outposts, 500 to 600 metres beyond the trenches, and by the barbed wire entanglements. The infantry also found them useful for finding hidden ammunition. So useful were they found to be that larger numbers were sent for, and as there were no further frontier dogs to be had a collection of those dogs used in other parts of Italy was made, namely, of the big shepherds' dogs from the Maremma. These are large powerful dogs, with shaggy coats. They are excellent guards and watches, but they are very fierce, and not nearly so well trained as the customs dogs; therefore, although these big fellows did good service in guarding the trenches, they were not nearly of the same use as were the other dogs, and could not be handled so easily. In fact, the point was strongly brought out, of the advantage of having men trained in peace time to understand the working of the dogs, as on this rests half the success. I have remarked that the Custom House officers went with their own dogs, and that there was perfect understanding between dogs and men, while the sheep dogs, hurriedly collected and without any special training, were among complete strangers, without sufficient understanding to know how to use them, and thus many were failures. The following is an account of the battle of Derna:—

"In the early part of the evening of February 11th-12th, the Turks, under cover of darkness, advanced in two columns against the Italian position at Derna; one column of about 500 men to the right, the other consisting of about 1,000 Bedouins, with a stiffening of Turkish officers. The whole of the country is difficult in the extreme, without roads, and crossed by a series of tracks for the most part known to the natives only, running on the edges of precipices.

"This force took every advantage of the sinuosities of the ground, and practically crawled undisturbed to the Italian position. The alarm, however, was given by the dogs chained to the entanglements, and at 1.30 began an engagement at this point, which lasted the whole night."

The idea has hitherto received little support in this country, and it was therefore a gratification to me when a request came from the men of the Norfolk Regiment for one of my dogs. I had the greatest pleasure in presenting them with one which worked with them through the manœuvres this summer. I have the following report from the officer of the company, to which it was attached :–

"I beg to forward a report called for on the value of the dog presented to my Company by Major Richardson. The dog, an Airedale terrier, arrived just before Brigade Training. Major Richardson forwarded full instructions as to its care, feeding and training.

"On three occasions I had the opportunity of using the dog on outpost duties at night. Each time I found the presence of the dog to be of the greatest value. He either remained beside the sentry or went with a patrol. His value consists in the fact that he can and does detect the approach of human beings some considerable time before the eye or ear of the average man can distinguish anything. The result is that the sentry or patrol is fully on the alert, and it is impossible for them to be either ambushed or 'rushed.' The dog is no expense, as he feeds on the remains of the men's dinner. He is never allowed to run loose in camp or barracks, and no one is allowed to feed him except the man in charge of him.

"I am of opinion that it would be a very valuable asset to have four of these dogs attached to every infantry battalion for service in the field.

"I hope at next Company Training to make more extensive trials of his usefulness. I should add that his method of indicating the approach of anyone at night is quite silent. It consists of a low growl and a stiffening of his body, almost like a pointer."

MEASURES ADOPTED IN FOREIGN COUNTRIES.

To speak of the work that is going on in foreign countries. I have the recent reports from abroad. In France great attention is paid to the training of dogs for messenger and outpost service. They are used in this connection with the Chasseurs and Alpine Regiments, and are a great success out in Algeria and Tunis.

There is a training establishment at Fontainebleau, built by the French Government.

In Austria they are used on the Italian frontier and in Bosnia and Dalmatia. The Alpine Jaegers, Kaiser's Jaegers, the regiments in the Tyrol, and the Bosnia Herzegovina Infantry Regiments have large numbers of dogs among them. Airedales are used to a very great extent as well as the native mountain sheep dogs.

The results are excellent. There is a training school at Wels in Upper Austria, and also at Seraievo.

In Austria they also train large quantities of police dogs. In Germany they employ dogs in guarding the fortifications and frontiers, but a very important point is that the organization of police dogs in this country is very large and perfect, and a scheme exists for the mobilization of all these dogs for use with the army. Their training, which is brought to a very high state of perfection with the police, enables them to be good scouts and guards, and to be good trackers.

It may be of interest for me to mention some trials that were made with the 15th German Army Corps, of which I have a report. In the delivery of messages, dogs were frequently sent at day and night from outposts to headquarters—a distance of 1,000 to 1,200 paces, where they arrived on an average of two to three minutes.

The report says: "The advantage of sending messages in this way is obvious, when it is considered that the course the dogs took was over ground where it would have been impossible for the pedestrian to leave the footpath.

"In the case of trials with sentry dogs, various experiments were made at night. Persons were despatched with the order to try and steal past the sentries, but in spite of the greatest caution they observed in their movements, they did not in a single instance succeed, because the dogs gave warning as soon as the person approached within 150 to 200 paces of the line of sentinels.

"The same was the case with dogs sent out with patrols. It was noticed that the dog did not give notice of the approaching patrol if he belonged to a detachment that was known to him, but if by any chance a stranger was encountered, his approach was notified by the dog at once.

"In the case of ambuscades, in this same way it was found that the dog ignored the presence of soldiers of a troop known to him, passing them in an unconcerned manner, but immediately gave warning in the case of strangers."

Belgium.—In Belgium dogs are used as sentries with several of the regiments, including the carabineers; they are also used for dragging machine guns and for ambulance dogs.

In the event of war, the Belgians, who have a perfect system of war dogs, would supply the army from the police.

Holland.—The chief interest in Holland is in ambulance dogs, some of which I have supplied myself. The ambulance dogs are with the Grenadier regiments quartered at the Hague, and lately there has been a training school established under the presidency of the Prince Consort of the Netherlands at the Hague.

Sweden.—They have very good systems of dogs, both for sentry and ambulance work, and trials are held periodically at Stockholm.

Russia.—A number of regiments have dogs for sentry work. One regiment, the Hussars of the Imperial Guard, at Tzarskoe Selo (the camp outside St. Petersburg), has now 23 Airedales. They have also dogs for ambulance work, and the numbers are increasing daily.

Bulgaria.—Has a most excellent system of military dogs. The whole frontier is guarded by these dogs, and they are with the pickets and detached posts.

I hope that in the foregoing I have placed in a clear way the advantage to the Service of employing properly trained dogs. I do not wish to prove too much, as great harm can be done by expecting impossibilities, but this I *do say*, that for scouting and sentry work, and for searching for the wounded, the natural qualifications of the dog are such, that he is an invaluable auxiliary to the soldier, and in view of the fact that foreign armies are all likely to adopt this aid in time of war, we ourselves cannot afford not to do so also. The advantage of a scout or sentry provided with a keenly hearing and scouting dog over one without, is so obvious as to require no further comment.

That it would be found to be an absolute necessity to provide our troops with dogs at the eleventh hour, is, I am convinced, a certainty, and as I have already said, this hurried collection does not answer, and is a most wasteful and expensive method.

The only safe way is to provide regiments in peace time with properly selected dogs.

In this country we would have no customs or police dogs at all to fall back upon, and therefore the army would require to train its own dogs.

This could be done at a training establishment, and from there the dogs should be drafted to the various regiments. They could be used in peace time, as is done abroad, with the sentries in forts, aeroplane sheds, magazines, etc., and by their use reduce the number of sentries required.

At the conclusion of the lecture, a series of slides was shown illustrating the types of dogs used by various Continental armies, and their equipment; and two Airedales, trained by Major Richardson, were also shown.

DISCUSSION.

The Chairman (Brig.-General R. C. B. Haking, C.B.): I will open the discussion by asking Major Richardson one or two questions which have struck me during the reading of the lecture. It appears to me, purely from the military point of view, that is to say from the fighting dog point of view, that we require two things in the army in this kind of service of security. One is for stationary work with a sentry or moving work with a patrol, and the other is for work independently of the sentry, the dog working semi-independently of the actual soldier who is in charge of the dog. Major Richardson has explained to us what the dogs can do with a sentry, and there is no doubt about it, that would be extremely valuable in war—in fact, it has been proved to be extremely valuable in war. The only thing I have to suggest against it at all is that we must not allow our sentries to become careless. I think most of us have had experience in war of the sentry going to sleep. If the sentries in the future are always given a dog to work with them, there will always be the tendency for them to say, "Here is old Bob, he will give us plenty of warning; we can have a bit of a nap." The sentry goes to sleep, and he leaves it all to Bob. Bob may be all right and warn him in time, but if he does not, Bob may be a source of danger instead of an advantage. We shall have to be very careful about that, but otherwise I have no criticism to make as regards the employment of dogs for sentry work.

I was very much interested in what Major Richardson said about the Abor Expedition, because I was myself in the Burma war many years ago, and there the dogs would have been of great assistance to us. We had to operate in thick jungles, in which the enemy tried to ambuscade us, and dogs would have been valuable for that sort of work.

INDEPENDENT WORKING OF DOGS.

The other point on which I wish to touch is the semi-independent working of dogs. It appears to me that from a military point of view they would be even more useful to us in that respect than a dog tied to a sentry. For example, infantry move very slowly, and they have to expend a great deal of energy in getting from one place to another. In war we want everything to go quickly, and we do not want to expend more energy than we need, so that when the big fight comes along we will have as many men as possible to take part in it. An outpost or an advance guard working in front or on the flank wants to know whether the enemy are ahead. If you have plenty of cavalry you can find out whether they are there or not, but very often infantry have to work without cavalry. Cavalry get collected in one place or they get drawn away in another direction, and the infantry have to do a great deal of scouting work themselves. What I want to ask the Lecturer more than anything else is whether it would not be possible to train dogs who would be able to go to a particular locality, say a wood to the right, and if they meet an enemy give some sign or signal or bark, or come back again. If they could be trained to do that they would be absolutely invaluable.

The Lecturer: Yes, I think it could be done, but it is extremely difficult.

The Chairman: You always find that the thing you want most is the most difficult thing to do. But if dogs could do that they would be invaluable.

The Lecturer: Yes; but in dealing with dogs one has to avoid overstating one's case. These things are *possible*, but one must not expect too much.

The Chairman: With regard to the breed of the dogs, I am not an Irishman, but I am very fond of Ireland, and I am particularly fond of its dogs. I should, therefore, like to ask Major Richardson if he has tried Irish terriers—are they any good?

The Lecturer: Yes, they are very good, but they are more excitable than Airedales. Then one can get Airedales almost absolutely mute. I have Airedales that never bark at all, and a most important point is that you want to eliminate all the barking. An Irish terrier is a magnificent watch, but he is rather apt to open.

Captain A. C. Temperley, The Norfolk Regiment, said he was the officer who received the dog from Major Richardson at Aldershot—a fact referred to in the paper. He received an application from his company saying they wanted a war dog. He had misgivings about it, because his experience was that dogs in barracks often developed into barrack dogs; they became scavengers and were apt to deteriorate. But as the men were so keen about it he wrote to Major Richardson, and much to his surprise and pleasure Major Richardson wrote back offering to present to the company a fully-trained dog—and a very fine specimen of an Airedale terrier it was, too. The G.O.C. 1st Division had called for a report upon this dog at the conclusion of the army manœuvres, and Major Richardson had read them this report. He could not speak too highly of the dog. He had tested it many times, the last occasion being the last night of the army manœuvres. The 1st Division was encamped not very far from the Blue Army, and his company was on outpost duty. The dog remained with the advanced sentries the whole night; they were on a public road, and the enemy were not very far away. He found that the dog invariably let the sentry know of the approach of a human being two or three minutes before the sentry could tell that there was anybody about. That he considered of the greatest value, because it meant that no sentry and no picket could ever be surprised as long as there was a dog there. When they remembered all the regrettable incidents in the South African War due to surprises at night, he thought that infantry officers in particular would feel very much greater confidence if they had dogs in the picket line. The misgivings that he had felt at the beginning were, he found, quite falsified, because he was lucky enough to spot the right man to look after the dog. The dog had not lost his keenness, and the men of the company took care that nobody else fed the dog but the owner.

There was one other thing he wished to say which Major Richardson had already emphasized, and that was the fact that in this—as in other matters—they ought not to trust to luck in a future war to muddle through as they had always done. They ought to get a definite policy about these dogs beforehand, and organize; and then when war did come—and it might come suddenly—they would have these dogs ready instead of trying to improvise them at the last moment. That, he believed,

would be the foundation of success with these dogs, that they should have some adequate resources to call on instead of trying to improvise them at the last minute.

Major-General J. B. Richardson: Major Richardson has a small belief in the use of dogs as messengers. I should like to ask Major Richardson whether he has been at "Gib" at all.

The Lecturer said that he had not.

Major-General Richardson: There are dogs there that would interest you immensely; dogs that are used for the smuggling that goes on through the lines between "Gib" and Spain. They put a large net right across, and every night the sand in front of this net is smoothed with a board notched in a particular way so that they see exactly what crosses; the two open ends are guarded by men. Nearly every day about 150 to 200 dogs laden with tobacco are sent from the neutral ground, and have to get through. As many as 40 or 50 dogs have been shot in a day in the attempt, so that the survivors get accustomed to shooting.

The Lecturer: That is a fixed position; it is the same position every day. But in war a regiment is always on the move, whereas at Gibraltar the dog is always going in the same direction.

Major-General Richardson: These dogs go both ways.

The Lecturer: Yes, but those two directions are fixed.

Major-General Richardson: That may be; but what I want to point out is that when they are turned loose these dogs do not go at once for any openings there may be. They hide themselves in little pits in the sand; I have often come across them lying flat, with their four pounds or more of tobacco strapped on to them. There are certain dogs that have been doing that for three or four years in spite of the shooting, so that you see how clever they get. They must often have been shot at. I asked one man how often he smuggled, and he said about two or three days a week, but it was very expensive smuggling, because they had to pay the guards a fixed sum to let them smuggle between certain hours—and thus let the dogs through. Some of the dogs swim a little way round the flanks. I said to one man, "Is your dog a very valuable dog? Does he always come home?" He told me that that dog had been at it for between two or three years, and that he would not take anything for him. I said "What! Not a hundred dollars?" He said "Why, he would make that in a month." So that that dog must have been going daily through the lines, avoiding people who were on the look-out for him. It was a surprising thing to me that they have never employed trained dogs against them. The guards trust to shooting. Some dogs get through on most nights, but sometimes have to wait for two days. A dog will not go until he is quite certain he can get through, so this man told me, and then they generally come home. These tobacco guards lie out on the sands in Spain for the purpose of shooting the dogs, and the dog has to get through that line of watchmen also. He does so; his intelligence leads him in the proper direction, and he eventually gets home to his master's house five or six miles away.

The Lecturer: There again he has a fixed point—his master's house.

Major-General Richardson: That is quite true, but the point I was trying to make is that these dogs get to stand the shooting. Forty or fifty of them are killed at a time, mostly young ones, but some manage to get trained.

There is one other point that I should like to mention. All over this country we have St. John Ambulance and Red Cross Detachments, and I do not see why each of these detachments should not be requested to keep a dog and train it. If that system was adopted we should have a number of trained dogs in case of war.

The Lecturer: Yes, that I think would be a very good idea, if they would have a dog attached to each detachment. I am exceedingly obliged to you for the suggestion.

Mr. E. Kilburn Scott said he was specially interested in what the Lecturer said about the Siberian railway being guarded by dogs during the Russo-Japanese War. There must have been some thousands of them on that line if they were so close together as 200 yards. Siberian bred dogs should be particularly good for the purpose mentioned, because of their acute sense of smell and quickness in hearing, and, like all natural breeds, the arctic dogs had prick ears. He admired the Airedale very much indeed, and if he kept a British breed should be inclined to the Yorkshire one, but he thought they could not be as alert because of their pendant ears. With regard to the white dogs of the Maremma which have been so successful in the Tripoli campaign, he wished to ask Major Richardson whether it would not be an advantage always to use white dogs for ambulance work. On a darkish night one would see such dogs so much more easily. Of course, for sentry work, dogs of a colour such as that of the Airedale would be best. There was an advantage in having a white dog for climatic regions. He had found by experience in connection with Arctic breeds that they stood the very hottest weather equally as well as the very coldest, if only they were white. He knew a dog from one of the Antarctic expeditions which was chained up in the open in an Australian Zoo for years. It had perfect health the whole time, although its only protection from the weather was a piece of corrugated iron. That was a Samoyede Siberian dog. Apparently the white furry coat had the same effect upon the dog as the wearing of white clothes by people in the summer.

For military purposes the barking of the dogs was, of course, a very important matter. The wolf did not bark; it knew better. By instinct it knew it must not give itself away by barking. Dogs which were near akin to the wolf only barked a little. The dogs in which he was particularly interested seldom barked. They could bark if necessary, but they had not the yap-yap habit, which apparently came from too much civilization. The Lecturer had made a very true remark about the Irish terrier. Dogs had nerves just the same as humans, and some breeds were much more nervous—neurotic, he would call it—than others. Perhaps the reason that the Airedale was so good was because, like the Yorkshireman, he was a mixture of breeds; certainly the inbreeding to obtain small size and perfection of coat, which had been going on in some breeds, seemed to have spoilt their tempers. Regarding the bloodhound, he could quite see it would be a failure, for war purposes, because of its weight and pendant ears. He attached great importance to the ears being elevated, and the drums thus able to catch the faintest sound waves.

NAVAL AND MILITARY CALENDAR.

NOVEMBER, 1912.

31st (Oct.) (Thurs.) Launch of first-class battleship "New York" from Brooklyn Navy Yard for U.S. Navy.

2nd (Sat.) Greek victory at Yenidje Vardar and Plati Bridge.

3rd (Sun.) Surrender of Prevesa to the Greeks (600 prisoners.)

4th (Mon.) Servians defeat Turkish rearguard on Perlepe-Monastir road.

7th (Thurs.) Launch of first-class battleship "France" from the "Ateliers et Chantiers de la Loire, St. Nazaire."

8th (Fri.) Surrender of Salonica, with 28,000 Turkish troops, to Greek main army.

11th (Mon.) Bulgarians capture Rodosto.

12th (Tues.) Turkey asks Bulgaria for an armistice.

14th (Thurs.) H.M.S. "Princess Royal" commissioned at Devonport.

15th (Fri.) H.M.S. "Inflexible" left for Mediterranean.

" " Greek main army leaves Salonica for Monastir.

16th (Sat.) Montenegrins occupy San Giovanni de Medua.

" " H.M.S. "King George V." commissioned at Portsmouth.

18th (Mon.) Servians and Montenegrins occupy Alessio.

" " Servian victory at Monastir; rout of the Turkish Western Army.

" " Unsuccessful Bulgarian attack on the Chatalja Lines.

19th (Tues.) H.M.S. "New Zealand" commissioned at Devonport.

21st (Thurs.) Launch of battle-cruiser "Hi-Yei" from Imperial Dockyard Yokosaka, for Japanese Navy.

" " Turkey rejects Bulgarian terms for an armistice.

" " Turkish cruiser "Hamidieh" damaged by Bulgarian torpedo attack.

22nd (Fri.) Capture of Mitylene by Greek Fleets.

" " Capture of Gumuljina by Bulgarians.

25th (Mon.) H.M.S. "Pegasus" arrived at Plymouth from Australia.

" " Capture of Chios by the Greek Fleet.

26th (Tues) Bulgarians occupy Dedeagach.

27th (Wed.) Surrender of two Turkish divisions (20,000) at Merhamli, near Dedeagach.

MILITARY CRYPTOGRAPHY.

A STUDY OF TRANSPOSITION CIPHER SYSTEMS AND SUBSTITUTION FREQUENCY TABLES.

By Captain M. Muirhead, R.F.A.

ANYONE who has read Edgar Allan Poe's "Gold Bug," a tale in which on the solution of a cryptogram depends the information which leads to the recovery of hidden treasure, will probably have felt the excitement occasioned by the knowledge that the signs, letters and figures before him concealed a meaning invaluable to him who could read aright.

He may also have felt the hopelessness of attempting to extract any sense from the gibberish before his eyes, ignorant as he may have been of how to set about the task.

In time of war dispatches and messages are frequently captured or intercepted, and if they are in cipher a knowledge of cryptography may enable the enemy's plans to be laid bare. Secure ciphers are likely to become more important than ever in the near future. Our present system of visual signalling, and the instruments in use under it, is rapidly becoming obsolete, if it is not so already. The cumbersome Begbie Lamp and the complicated helio (unsuitable for most European climates), the long and tediously detailed training necessary to make a man a signaller, under the present system, and the celerity with which this training fades away, point to the want of other things. Wireless telegraphy (the installation for which can now be carried by one mounted man, and is so used in the United States Army), a communication agent which can be used night or day, and has other advantages, is likely to eventually be universally used for all but very short distances, aided by telephony and semaphore. It is quite possible, therefore, that when wireless is much used in war, messages may actually be received by the enemy before the persons on our own side, for whom they are intended, get them. This, in spite of the recent improved methods of tuning. In these circumstances

cryptography will play an important part in communication. The necessity for secure, simple systems of cipher will be increased a hundred-fold. It may also be necessary to have officers trained in cryptography, to whom will be handed all intercepted cipher messages for solution.

The United States Army appears to have recently come to the conclusion that cipher systems are useless, as they afford little security against the knowledge of the expert, and it is pinning its faith to a code-book. In a former article[1] on this subject the value of the comparative recurrence of the letters of the alphabet was shown to be very great in solving a cryptogram. The frequency of occurrence of letters is practically constant for all messages, manuscripts, etc., of 10,000 letters or over. For instance, the letters E T O A N will be found to occur in that order of frequency in practically any manuscript of 10,000 letters or over. The frequency table is, of course, *approximately* correct for any message which contains a number of letters not less than 5 times the number of letters of the alphabet, *i.e.*, 130 letters; a message containing even a less number of letters than 130 will often show a preponderance of E's, T's and O's, etc., over other letters of the alphabet. The ordinary table of frequency is as follows:—

E T O A N I R S H D L C (F U) M P Y W G B V K X (J Q Z).

The letters in brackets recur an equal number of times. It has, however, recently been pointed out by Lieutenant Karl Truesdell, of the United States Army, and almost simultaneously by Major S. F. Stallard, R.F.A., that the frequency table for the solving of military cryptograms would differ from the ordinary table of frequency. This difference is only slight in English, but considerable in foreign languages. It is due to the brevity of military phraseology, and the omission of words like "to," "the," "at," "from," "I," etc., in military dispatches, owing to the necessity of condensing them for enciphering purposes or for telegraph and signal, and, in foreign languages, to gender terminations. As the table of frequency rarely pans out for any ordinary message exactly in the normal order, the difference between the normal frequency and military frequency is not very material. Lieutenant Truesdell has, however, made out frequency charts for six languages on the basis of military dispatches, messages, etc., and these tables he has kindly allowed the writer to reproduce. He has also made out charts for the same six languages, similar to the one made out by the writer for the English language in a former article, and these are also reproduced:—

[1] See October, 1911, JOURNAL, page 1321.

ALPHABETIC FREQUENCY TABLES.

TABLE No. 1.

Percentage of Frequency.

Letter	English	German	French	Italian	Portuguese (*†)	Spanish
A	7.7	5.2	8.0	11.7	14.0	13.4
B	1.5	1.8	0.6	0.6	0.6	1.6
C	2.9	3.1	3.3	4.5	3.4	4.0
Ch	—	—	—	—	—	0.2
D	4.1	5.1	4.0	*3.1	4.0	4.9
E	12.5	17.3	19.7	12.6	14.2	13.3
F	2.2	2.1	0.9	1.0	1.2	0.8
G	1.8	4.2	0.7	1.7	1.0	1.3
H	5.9	4.1	0.6	0.6	1.0	0.5
I	6.7	8.1	6.5	11.4	5.9	6.6
J	0.5	0.1	0.3	†	0.5	0.4
K	0.8	1.0	—	**	—	—
L	4.7	2.8	4.9	7.2	3.2	4.9
Ll	—	—	—	—	—	0.5
M	2.9	2.0	3.1	3.0	4.6	2.8
N	6.4	12.0	7.9	6.6	4.8	7.0
ñ	—	—	—	—	—	0.2
O	7.8	2.8	5.7	9.3	11.0	8.8
P	2.3	0.8	3.2	3.0	2.8	2.7
Q	0.1	††	1.2	0.3	1.6	1.0
R	6.7	6.9	7.4	6.4	6.4	6.5
Rr	—	—	—	—	—	0.4
S	6.0	‖5.7	6.6	4.9	8.8	7.6
T	8.0	6.0	6.5	*6.0	4.3	4.3
U	2.9	5.1	6.2	2.9	4.6	4.0
V	1.0	0.9	2.1	2.0	1.5	1.0
W	1.7	1.5	††	—	—	—
X	0.3	††	0.3	**	0.1	0.1
Y	2.4	††	0.2	**	0.06	0.8
Z	0.2	1.4	0.1	1.2	0.4	0.4

*† Permanent diagraphs not considered.

* "t" and "d" are interchangeable; therefore the individual percentages assigned will vary more or less.

† Substitute for double "i" at beginning, middle and end of word. Is an auxiliary only.

†† Occasional.

** "k" equals "c" or "ch"; "x" equals "s" or "ss" and "y" equals "i."

‖ "ss" ("sz") treated as two characters.

TABLE No. 2.

Order of Frequency.

English.

E T O A I N S L D C Y P F W B V K J X Z Q
R H M G
U

German.

E N I R T S A D G H C L F M B W Z K V P J Q X Y
U O

French.

E A N R S I U O L D C P M V Q F G B J Y Z W
T H X

Italian.

E A I O L N R T S C D M U V G Z F B Q
P H

Portuguese.

E A O S R I N M T D C L P Q V F G B J Z X Y
U H

Spanish.

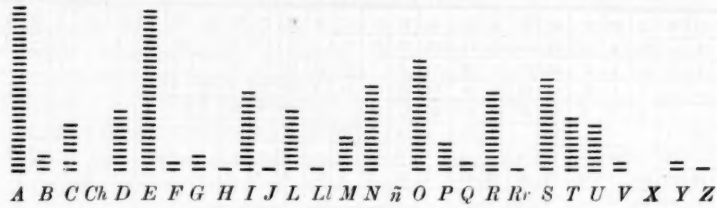
A E O S N I R D T C M P B G Q F H J Ch X
L U V Y Ll Rr ñ
Z

In Spanish the compound letters "ch," "ll," and "rr" are suppressed in ciphering in order to avoid possible confusion.

Italian.

Portuguese.

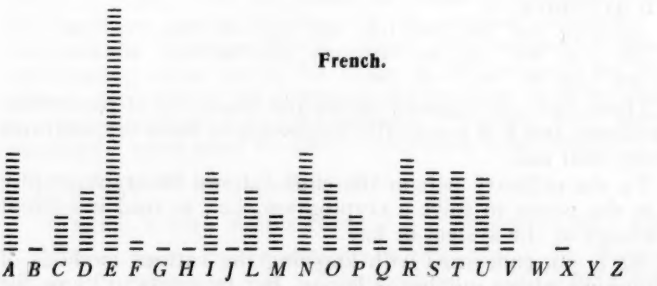
Spanish.



English.

German.

French.



The possibility of making a table of this frequency of occurrence is not confined to single letters, and the following table gives the comparative frequency of all " duals " (*i.e.*, combinations of two letters) in the English language.

COMPARATIVE FREQUENCY TABLE OF DUALS.

	E	O	A	I	U	Y	T	N	R	S	H	D	L	C	F	M	P	W	G	B	V	K	X	J	Q	Z	
E	24	2	—	20	5	1	24	26	75	24	119	33	37	30	7	28	13	9	11	24	31	6	—	1	—	1	E
O	16	7	1	36	1	7	45	17	27	32	25	8	9	26	25	14	14	11	5	1	4	—	1	1	—	—	O
A	45	4	—	8	1	15	18	22	27	24	52	20	13	16	8	16	17	8	3	1	3	2	2	1	—	—	A
I	13	3	5	2	3	1	45	25	26	26	25	27	19	8	15	16	6	12	1	2	5	7	—	—	—	2	I
U	1	36	1	—	—	—	10	—	7	13	5	14	7	3	8	2	2	—	4	3	—	—	1	1	4	—	U
Y	9	—	7	—	—	—	16	4	7	2	2	3	16	—	—	2	—	—	1	4	—	—	—	—	—	—	Y
T	27	18	58	40	7	9	23	49	33	44	7	27	5	6	17	2	4	3	3	1	—	—	3	—	—	—	T
N	49	81	84	63	22	—	1	4	8	6	1	1	—	—	1	4	—	3	4	—	—	2	—	—	—	—	N
R	81	53	34	12	22	2	16	2	4	4	4	5	3	5	10	4	17	—	10	1	—	—	—	—	—	—	R
S	51	15	35	34	22	7	13	25	18	25	—	5	4	1	4	2	4	1	4	2	—	1	—	—	—	—	S
H	9	3	2	—	—	3	149	5	4	21	—	6	2	23	2	—	2	12	7	—	—	—	—	—	—	—	H
D	61	2	14	4	2	4	2	61	8	2	1	1	9	—	2	—	—	2	—	—	—	—	—	—	—	—	D
L	12	13	30	13	10	—	7	6	7	5	2	2	18	5	4	—	7	—	1	14	—	—	—	—	—	—	L
C	29	6	14	23	2	1	2	22	5	8	—	2	—	2	5	—	—	1	—	—	—	—	—	—	—	—	C
F	17	55	6	5	3	2	2	6	1	7	1	5	4	—	7	2	—	—	4	—	—	—	—	—	—	—	F
M	26	21	15	6	—	3	3	2	9	2	3	6	1	—	5	8	—	—	—	—	—	—	—	—	—	—	M
P	17	7	5	1	8	2	2	4	2	17	—	3	3	—	1	9	5	—	1	—	—	—	5	—	—	—	P
W	17	9	1	—	—	4	7	4	—	5	2	4	3	—	—	1	1	2	1	—	—	—	—	—	—	—	W
G	7	4	4	5	1	2	—	23	7	2	1	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	G
B	5	5	11	2	6	1	3	3	1	7	—	2	2	—	1	2	—	—	—	—	—	—	—	—	—	—	B
V	11	7	6	10	10	1	—	1	4	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	V
K	4	—	1	—	3	—	—	—	5	1	1	1	—	1	—	—	—	—	—	—	—	1	—	—	—	—	K
X	8	1	—	3	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X
J	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	1	—	—	—	—	—	—	J
Q	1	1	—	—	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Q
Z	—	—	1	2	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Z
	E	O	A	I	U	Y	T	N	R	S	H	D	L	C	F	M	P	W	G	B	V	K	X	J	Q	Z	

For example, EA occurs 45 times in an ordinary manuscript to AE's nil recurrences. TH occurs 149 times to HT's 7 recurrences, or BL's 14 recurrences, and so on.

This table will be found useful in solving such systems as the "Playfair" (a two-letter substitution cipher system). The recurrence of groups of three letters has also been determined, and is as follows:—

the (67), and (21), tha (18), hat (14), edt (13), ent (13), for (13), ion (13), tio (12), nde (11), has (10), men (10), nce (10), oft (10), sth (10).

These various frequency tables and charts are of paramount importance, and it is practically impossible to solve cryptograms without their aid.

To the ordinary person the chief interest in cryptography lies in the power to solve a cryptogram, *i.e.*, to read it without knowledge of the system or key.

He is not concerned with knowing the various methods of enciphering whose number is legion, but he wants to know the general lines on which to proceed to solve a cryptogram. It is exceedingly difficult to lay down any rules, even general ones, for the solution of cryptograms. Much depends on training, perseverance, luck, guesswork and intuition. It is, of course,

not difficult to evolve a cipher system which is insoluble for all practical purposes, but to render a message so usually entails methods which unfit it for uses in the field. They are usually either "mechanical" ciphers, *i.e.*, they necessitate each correspondent having a diagram of some sort, or they are so complicated and take so much time to use that they are quite unsuitable for military purposes.

A cryptogram some few years ago took accomplished French experts eight months to lay bare, and the ordinary amateur would scarcely attack any cipher with such dogged determination as that.

But the cipher system in question was quite unsuitable for military uses, although so secure, owing to its complexity.

In the art of solving cryptograms it is emphatically the case that "practice makes perfect."

We will suppose then that the reader has suddenly put before him a military cryptogram which he is asked to solve.

The general lines on which to proceed are as follows:—

1. Endeavour to ascertain in what language the original message was written. That being decided, as far as is possible, the next step is:—

2. Count up the frequency of occurrence of the different letters of the cryptogram (or a part of it).

This is a very important step, and will decide in which of two large classes of cipher systems the present cryptogram is to be placed. These two large classes are called "Substitution" and "Transposition" ciphers.

It is necessary to digress a little here to explain what is meant by these two terms. Suppose when we wished to put a message into cipher we decided that A B C D E, etc., in the message should be replaced in the cipher by Q R S T U or N P L T Z, etc., then we should *substitute* other letters (or may be figures or signs) for those of the original message. That would be a "Substitution" cipher. But suppose instead of substituting other letters for those in the message we merely change the order of the letters of the message so as to disguise it, that would be a "Transposition" cipher, *e.g.*, take the message "when shall we meet," and write it backwards:—

T E E M E W L L A H S N E H W.

That is a very simple form of a "Transposition" cipher.

There exist cipher systems which cannot be classed as either "Substitution" or "Transposition," and some which are a combination of both. An example of the former is a case mentioned by Mr. Hulme. There was a curious old inscription over the decalogue in a country church—it ran as follows:—

P R S V R Y P R F C T M N V R K P T H S P R C P T S T N.

It is said that the meaning of this was not discovered for over 200 years, but if a sufficient sprinkling of one more letter, "E," be added to the above it will be seen that it reads "Persevere ye perfect men, ever keep these precepts ten." This might be called a "Deletion" cipher system.

It is not proposed to deal with combinations of substitution and transposition systems in this article. They are very complex, and usually unsuitable for military purposes.

We are now therefore deciding in the second step in solution whether the cryptogram under inspection is a "Substitution" or "Transposition" cipher system. It will be easily understood that once a table of frequency of the letters of the cryptogram has been formed, a glance will enable one to decide the point in question. If it is a "Transposition" cipher system the table of frequency of the cryptogram should resemble the normal frequency table. If it is a "Substitution" cipher system where the letter N for example in the cipher has been substituted for the letter E in the "clear," and so on, then the table of frequency will certainly not resemble that of the normal. The table of frequency of the cryptogram in this latter case will probably be headed by "N," whereas "E" heads the list in the normal and so on.

An example will make this clearer. Let our cryptogram be:—

M I E K F S A E S O T O N R E F H F Y I R K E S A S V N C O G L
I O O L O O C W N D O S E L D I D T B E I E S T Y D T R O O L G
I I L T A E O N D H C O N G

The table of frequency works out as follows:—

A = 3	G = 3	M = 1	S = 5	Y = 2
B = 1	H = 2	N = 5	T = 5	Z = 0
C = 3	I = 7	O = 12	U = 0	
D = 5	J = 0	P = 0	V = 1	
E = 8	K = 2	Q = 0	W = 1	
F = 3	L = 5	R = 3	X = 0	

Or put in order of frequency:—

O
E
I
T
N
S
D
L
} occur equal number of times.

A
R
C
F
G
} occur equal number of times.

etc.

E
T
O
A
N
I
R
etc.

NORMAL FREQUENCY TABLE.

It is at once apparent that the table of frequency even in the short cryptogram above corresponds *approximately* to the normal frequency table, and we are therefore justified in saying that our cryptogram is formed on a "Transposition" system.

On the other hand, take the cryptogram:—

U L T C P N F W Z C O C P N X Z Y N Z C A D O L C X P P L F C
W P A C P X T P C D P A E P X M C P D P D D A C P X T P C D P
N S P W Z Y D A W L N P D L F I A Z T Y E D T Y O T B F P D.

The table of frequency works out as follows:—

P = 17
C = 11
D = 9

This has not the least resemblance to the normal frequency table, so we can assume at once that this cryptogram is based on a "Substitution" system.

L, T, A = 6 (X, Z) = 5 etc.

It would be sufficient for an expert to notice the number of X's and Z's to tell him at once that substitution had been employed in the second cryptogram above, as these letters rarely occur in ordinary manuscripts.

Having decided then whether the cryptogram under inspection is formed by a substitution or transposition cipher system the ways part. The further tests in solution are different in the two cases.

The ordinary tests and general lines of procedure for the solution of one-letter *substitution* ciphers were enunciated in a former article on this subject, and it is not proposed to touch on them further at present.

A two-letter substitution system such as the "Playfair" affords great security, and is usually very difficult of solution.

Transposition ciphers are divided roughly into two classes, *viz.*, regular and irregular. Most of those who are familiar with cryptography hold the opinion that transposition ciphers are easier of solution than substitution ciphers. The writer has not found this to be always the case. A carefully arranged transposition cipher sometimes affords considerable security while minimizing the work of enciphering and deciphering.

Let us examine "regular" transposition ciphers first. It is possible on the groundwork of regular transposition ciphers to build up a great variety of systems.

To encipher a message on a "regular" system the letters of it are usually written out in a diagram which has a certain number of horizontal lines and vertical columns. Then the letters are read off in a new order to form the cryptogram. The formation (*i.e.*, the number of letters in each horizontal line and vertical column) of the diagram and the method in which

the message is to be written out in it are of course decided on beforehand by the two correspondents.

For example, let us say the two correspondents have decided on a rectangle or rectangles (if the message cannot be contained in one) of 10 by 4, and the message is "Artillery is but the handmaid of the other arms." Then the message is written out as follows:—

A R T I L L E R Y I
S B U T T H E H A N
D M A I D O F T H E
O T H E R A R M S P

It will be seen that we are one letter short in the last column, and a dummy letter is introduced to make up the number. Let it be P.

The cryptogram is then formed by reading off the letters vertically.

A S D O R B M T T U A H I T I E, etc.

A message can be written out in the diagram in various ways, but the four most frequent forms are as follows:—

Firstly, what is known as the "simple" reading, which is as above. In the following diagrams, figures have been substituted for letters merely to make the methods plainer.

SIMPLE.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40

Cryptogram: 1, 11, 21, 31, 2, 12, 22, 32, etc.

Secondly, what is known as the "simple alternate" reading, which is:—

SIMPLE ALTERNATE.

1	2	3	4	5	6	7	8	9	10
20	19	18	17	16	15	14	13	12	11
21	22	23	24	25	26	27	28	29	30
40	39	38	37	36	35	34	33	32	31

Cryptogram: 1, 20, 21, 40, 2, 19, 22, 39, etc.

Thirdly, the "simple diagonal" reading, which is as follows:—

SIMPLE DIAGONAL.

1	3	6	10	14	18	22	26	30	34
2	5	9	13	17	21	25	29	33	37
4	8	12	16	20	24	28	32	36	39
7	11	15	19	23	27	31	35	38	40

Cryptogram: 1, 3, 6, 10, 14, 18, 22, 26, 30, 34, etc.

Fourthly, the "alternate diagonal," which is as follows:—

ALTERNATE DIAGONAL.

1	2	6	7	14	15	22	23	30	31
3	5	8	13	16	21	24	29	32	37
4	9	12	17	20	25	28	33	36	38
10	11	18	19	26	27	34	35	39	40

Cryptogram. 1, 2, 6, 7, 14, 15, 22, 23, 30, 31, etc.

It will be noticed that in the last two cases, *viz.*, simple diagonal and alternate diagonal, the cryptogram is formed by reading off the letters of the diagram horizontally instead of vertically. Variations on these four forms are easily manufactured.

Now, having become acquainted with some of the forms which regular transposition ciphers ordinarily take, the question arises how to set about the solution of such cryptograms. The answer is not difficult to foresee. Firstly, count up the number of letters in the cryptogram. Let us suppose it is 45. The factors of 45 are either 9×5 or 15×3. We shall therefore have to form rectangles of which the sides are either 9×5 or 15×3 and make trial of the letters of the cryptogram placed in the various orders of the "simple," "simple alternate," "simple diagonal," and "alternate diagonal," as shown above, and ascertain if any of these readings will produce sense. If we fail in these four readings, then still keeping to a rectangle either 9×5 or 15×3, we shall have to try other readings. A long and tedious business, but typical of all work connected with cryptography.

In order to eliminate the certainty with which rectangles can be formed, which in the end will give the true reading of the "regular" cryptogram, by merely counting up the number of letters in it, a transposition cipher system of the following type has been put forward by Major Stallard, Royal Field Artillery. The method is as follows:—

The letters of the message (irrespective of its length) are placed in a series of rectangles, the dimensions of which are agreed on beforehand.

This will almost invariably leave some letters of the message over.

These spare letters are then placed in the smallest rectangle that will contain them, dummy letters being added if necessary to form a complete rectangle.

Example:—

"Gunnery is the science of directing a projectile so that it will strike a given object."

Dimensions of rectangles agreed on:—

5×4

The message is written out as follows:—

G	U	N	N	E	F	D	I	R	E	E	S	O	T	H	G	I	V	E	
R	Y	I	S	T	C	T	I	N	G	A	T	I	T	W	N	O	B	J	
H	E	S	C	I	A	P	R	O	J	I	L	L	S	T	E	C	T	X	
E	N	C	E	O	E	C	T	I	L	R	I	K	E	A					

The message consists of 71 letters, 60 of which are placed in the larger rectangles.

This leaves "G I V E N O B J E C T" (11 letters) over.

Add X to make 12 letters, and put them in a rectangle 4×3 by the side of the others.

The message then reads:—

G R H E U Y E N N I — G N E I O C V B T E J X

To decipher, divide the message by 20 (5×4), =3 and 12 over.

It will then be known that there are three of the larger rectangles to be filled, with a smaller one to contain the last 12 letters. A short trial will easily decide the dimensions of the smaller rectangle.

It is plain that if we tried to solve this cryptogram by counting up the letters and making a rectangle having the two sides equal to some two factors of this number, we should fail. A way of getting over this difficulty is by dealing with a limited number of letters only, determined by the number of vowels occurring in this number. For want of a better term we may call it a "vowel" test. It has been found very useful in solving several forms of transposition cipher. It is useless in connection with substitution ciphers. It is based on the fact that in the English language the recurrence of vowels is 40 per cent. In French it is 44.5 per cent., and in German 35 per cent. If this percentage is borne in mind it will very often enable the cryptographer to decide whether he has under his eyes a number of letters which he may be justified in assuming to be complete words transposed, and may reduce his labour and field of speculation considerably. It would not be safe, of course, to merely count up 40 vowels from the beginning of any transposition cipher and assume that they and the consonants accompanying them made up approximately complete words, *unless* the number of consonants was approximately sixty.

It may frequently occur that a complete number of words will *not* give anything like this percentage, just as in substitution ciphers, plenty of long messages will show other letters than those representing E, T and O preponderating. Usually the percentage is very true, even down to 25 letters (10 vowels and 15 consonants).

One could almost say, however, paradoxically, that the rule is the exception in cryptography, so unstable are its foundations.

When the percentage works out correctly it only remains to make trial of rectangles made up of the factors of the number of letters that give us our right percentage of vowels. An example will best show the application of this vowel test:—

Let the message be "No artillery will be kept in reserve and the greatest amount of fire possible will be developed at dawn," and the factors agreed on be 7×8.

N	O	A	R	T	I	L
L	E	R	Y	W	I	L
L	B	E	K	E	P	T
I	N	R	E	S	E	R
V	E	A	N	D	T	H
E	G	R	E	A	T	E
S	T	A	M	O	U	N
T	O	F	F	I	R	E

P	O	S	S	I	B	L
E	W	I	L	L	B	E
D	E	V	E	L	O	P
E	D	A	T	D	A	W
N	N	O	Q	R	S	T

(6 dummy letters)

As this is a short message, and to save labour, count up 20 vowels instead of 40. This should be combined with 30 consonants if the percentage is to be correct.

The cryptogram is :—

N L L I V E S T O E B N E G T O A R E R A
R A F R Y K E N E M F T W E S D A O I I I
P E T T U etc.

We have then here 20 vowels combined with 27 consonants. That is sufficiently correct.

Total number of letters 47. That number has no factors, so try rectangles of the factors of the numbers above and below it, *viz.*, 48 and 46. The first number gives us factors 6×8, which on trial enables us to arrive at the right reading, although the original factors were 7×8.

This "vowel" method of solution is only a guide and does not dispense with trial.

An ingenious form of Transposition cipher was recently invented by a Territorial Officer. He wrote out the message in the "clear," following the course of the Knight's moves on the chess-board, placing a letter in the position of each move, and then formed the cryptogram by reading off the letters horizontally from left to right. The system, however, is not suitable for military purposes, as it has little elasticity, that is to say, it does not admit of frequent change, a *sine qua non* of a good military cipher. It has also other properties, which identify it with a "mechanical" system (*e.g.*, a diagrammatic figure has to be formed unless all persons who may use the system know the Knight's moves on a chess-board, which is improbable), and so preclude its use in war.

In conclusion, it may be pointed out that although on the face of it a short Transposition letter cipher would appear to be easier of solution than a long one, as it would offer less choice of combination or permutation, yet this is only true with regard to texts up to about 30 letters. The longer a transposition letter cipher becomes, the more columns and lines there will be, and

therefore, the more likely is the cryptographer to meet with combinations of letters which put him on the right track. The less a transposition system permits comparison between different columns or lines, the more undecipherable it will be.

The form of transposition cipher called a "grille," invented by the Austrian Colonel Fleissner von Vostrowitz, and described in a former article, is very secure, but as it necessitates each correspondent having a diagram it is unsuitable for military use.

It will be easily understood that it is easier to form a transposition cipher system than a substitution cipher system, but it is very much more difficult to form a good transposition system suitable for military purposes than it is to form a secure substitution system suitable for the same purposes.

SOME ENVIRONMENTAL FACTORS IN RELATION TO DISEASE AFLOAT.[1]

By Fleet Surgeon C. Marsh Beadnell, R.N.

"The only people, scientific or other, who never make mistakes are those who do nothing."—*Huxley.*

WHEN first I was asked by my friend and teacher Professor Bassett-Smith to read a paper at this meeting I declined, because, firstly, the subject of Naval Hygiene has been worn so threadbare that it is difficult to place any particular aspect of the subject before you in a way at once original and interesting, and secondly, there are others better equipped to discharge this duty. However, Dr. Bassett-Smith was persuasive, I was weak, and the nett result is this paper.

When a number of observers are working upon any particular subject there is a tendency, as they explore the various nooks and crannies in their selected area of work, to lose touch with one another; what they then need is a breathing space in which the unwieldy mass of collected facts can be sorted and co-ordinated into a coherent whole. In this way the various workers can appreciate their relative positions and their outlook, old seams giving poor returns can then be abandoned, and fresh lines of research promising greater profits taken up with renewed zeal. I propose to-day to take a bird's-eye view of our whole subject, select for examination salient features, and submit for your consideration any comments and suggestions upon these which, in my humble opinion, merit attention. For these various reasons the title selected is "Some Environmental Factors in Relation to Disease Afloat." By these factors I allude to the accommodation, clothing, food, work, recreation, and sanitation of all those who go down to the sea in ships. There is no occupation so fraught with monotonous routine, yet withal so teeming in variety, as that of the average sailor. He "turns out," scrubs decks, goes on watch, eats his meals, drinks his grog, smokes his baccy, goes ashore, returns on board, and finally "turns in" to the tick of the clock, and if he is out but a shade in his reckoning there's trouble. Here is the monotony almost of automatism. On the other hand, what diversity: shivering in the North Sea in "blues," sweltering in the doldrums in "whites;" now enjoying fresh milk, vegetables and good butcher's meat, and then condemned to

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[1] A paper read at the Public Health Congress in Berlin, July, 1912.

salt pork and "tinned tack." Here his wrinkled and tanned skin spells a sojourn in arid climes, and there, with the columns of the wet and dry bulb standing side by side the livelong day, he perspires from every pore.

"I've heard him asperse
With many a curse
Our wretched English climate,"

and again I've heard him, satiated with the tropical glare, wax eloquent over the advantages of a "good old London fog." But the vicissitudes to which our sailor has to adapt himself are by no means limited to such perennial types, for he is subjected also to the much more trying multi-diurnal variations necessitated by his work. Now below with the thermometer at 100, a little later on deck with the temperature below freezing point; at one instant breathing the purest of ozone-laden airs, and at another that oppressive atmosphere of the 'tween decks when rough weather demands closed scuttles, skylights, and hatches. Here we find him in an open boat in a loppy sea, and there he is playing billiards in a 'stone frigate'; not content with mastering the surface of the waves, he descends into the depths below; to-day one of a thousand, almost lost in an armoured mammoth, to-morrow the sole and solitary occupant of a fragile aeroplane. Truly the life of a sailor demands of him the utmost plasticity if he is to successfully hold his own with his regularly irregular environment.

ACCOMMODATION.

In considering the hygiene of a ship, or rather of its compartments, we have to keep constantly before us the four following cardinal points:—firstly, the cubic capacity per individual; secondly, the potential as compared with the available area of the aerating inlets and outlets, and the speed with which the air flows through them; thirdly, the temperature; and fourthly, the humidity; variation in any one of these four factors in a ship must react upon the health of its inmates. Speaking generally, the uppermost parts of a ship are ventilated by natural means, the lowest parts by mechanical means, and the intermediate zone by mixed ventilation. Most important is it to distinguish between potential and actual areas of ventilation, since it enables us speedily to ascertain whether fault lies with the means of ventilation or with the supervision of those means. Let me illustrate:—Quite recently, while engaged in making a systematic examination of some living spaces, I found on one deck 450 square feet in use out of a possible 464 square feet—that is 97 per cent. of the potential ventilation was in use; in another living space there were four square feet of actual ventilation out of a possible 58 square feet, that is, seven per cent. only of the potential ventilation was in use. The main objects of ventilation are the expulsion of bad air and the supply of

good air at an appropriate temperature; any supply of good air must displace and eventually discharge an equivalent quantity of air which, though impure, is not necessarily the worst air; conversely, the extraction of bad air must be followed by an influx of purer air from neighbouring parts, but not necessarily of the purest air available. The interior of a ship is so complicated that a method of ventilation by exhaust, unless maintained over a long period, produces no appreciable improvement in the air of remote parts. A system of supply is better, but the ideal system is undoubtedly one in which forcible *plus* natural supply is aided by a forcible *plus* natural exhaust. As a general rule parts well above the water-line are ventilated by natural means through openings above, such as the trap-doors, hatches, gangways and skylights distributed in the ship's long axis, and the port-holes and scuttles in her sides. When there is any relative velocity between the ship and the circumambient air the latter is driven with more or less speed into the various compartments, entering the ship via apertures on the windward side and emerging by the lee apertures; when, however, relative velocities are the same the fresh and foul air gradually diffuse, the former into, the latter out of the ship. The interchange is, of course, briskest in the above-the-water-line compartments; in submerged parts it is so feeble that resort to artificial circulation becomes necessary. Where ventilation is almost entirely by natural means the cubic space per unit must be large; where, for fighting efficiency, cubic space per unit has had to be cut down to the lowest possible limit, the oxygen ratio can only be kept constant by mechanical supply. Here, as I write, are two ships lying almost within a stone's throw of one another, one, a training ship, obsolete, fitted with large, square, old-fashioned port-holes and ventilated almost entirely by natural means, has a space per unit as much as 290 cubic feet on the sleeping decks; the other, one of our most modern super-dreadnoughts, with sleeping decks ventilated principally by mechanical means has a space per unit as low as 86 cubic feet. Yet both ships are well ventilated as regards their sleeping decks.

How often should the air in a compartment be renewed? It is impossible to give a categorical answer to such a question, so many factors have to be considered that we can only generalize and say "just so often as prevents the oxygen ratio falling to a limit which is producing harmful effects upon the men." Haldane says that 1,250 cubic feet must be supplied to each person per hour to maintain an atmosphere containing less than 12 parts per 10,000, which he regards as the boundary zone between safety and danger. Taken *alone*, rapidity of change in the atmospheric contents of a compartment is no criterion as to the purity of the atmosphere. To take two extreme cases—a large hold containing over 100,000 cubic feet was ventilated solely by a single hatchway, but as only one man ever contaminated the air it was invariably cool, pure,

and sweet though many days were required to completely renew the contents; on the other hand, the air in a stokehold was often oppressive though renewed every other minute. The following may be taken as fairly approximate, bearing in mind that the hourly delivery of modern fans is over a million cubic feet:—

TABLE I.

	Situation.	Time required to completely renew the air.
1.	A large Hold, no fans	4 days.
2.	Medium Hold, with fans	15 minutes.
3.	Small Auxiliary Machinery Room	5 minutes.
4.	Small Auxiliary Machinery Room aided by hose-pipe connections	4 minutes.
5.	Sleeping Decks, "Dreadnought" Class, usual conditions ...	3 minutes.
6.	Sleeping Deck, Training Ship, usual conditions	2½ minutes.
7.	Sleeping Deck, "Dreadnought" Class, fans full blast	1.03 minutes.
8.	Stokehold, normal draught ...	1 minute.
9.	Stokehold, forced draught ...	0.75 minute.

Closed compartments can only be properly ventilated if there are clear and separate means of ingress and egress. For this reason all ventilating trunks should be overhauled at intervals, especially those of an exhaust system, which are liable to get almost completely choked by dust and small particles of *débris*. Bad air, though heavier than pure when weighed at the same temperature, is generally hot and therefore at the top of living compartments; on this account the pipes of ingress should, I think, be taken to the bottom of living compartments as is done in our Houses of Parliament, one of the most wonderfully well-ventilated institutions in the world; for the same reason the terminations of the exhaust pipes should be near the top of compartments. Engine rooms and stokeholds are ventilated by two or three motor fans which aspirate from the open, the fresh air passing in through trunks running horizontally below the upper deck, and dipping vertically into the various sections requiring supply. In the stokeholds the natural uptake induced by the furnaces is, as a rule, ample for all the personnel present; however, even here bad and hot air is liable under exceptional circumstances to accumulate in the upper parts, whence under normal conditions it would have been aspirated up the funnel-casing, an annular space which surrounds the funnel. In forced draught this uptake is closed, and the heated foul air then accumulates above to a pitch that at times is well nigh intolerable. With regard to the natural ventilation of submerged parts, I think a good deal more use might be made of the

hollow masts of masted ships than is at present the practice; these masts, reaching as they do to the nethermost regions of the vessel, could, without any aid of fans, be made to supply those parts throughout day and night with constant streams of fresh air. A trumpet-shaped aperture of ingress, with a device for preventing the admission of driving rain, could be fitted high up in the mast where it would be clear of spray or smoke from the funnels.

It is extremely difficult to estimate the mean allowance of cubic space to each individual in a man-of-war, owing to the hopeless task of calculating the capacity of all the heterogeneous obstacles which must be allowed for. Where we simply wish to compare classes of ships, we can frame a rough estimate by striking a ratio between tonnage (W) and complement (N), $\frac{W}{N}$, or, by determining a relation between all the external openings (E) and the total volume (V) of the vessel, $\frac{E}{V}$, or, better still, the sum of the relations between the various compartments and their respective inlets (e) and outlets (v), $\frac{e}{v}+\frac{e^1}{v^1}+\frac{e^2}{v^2}+$. etc. Where ventilation is natural 140 cubic feet per unit should be the irreducible minimum on sleeping decks. As a rule hammock hooks are limited in number, and are so arranged—being only 18 inches apart—that the hammocks touch one another transversely, and all lie in the same plane. It would be a great advantage from a medical point of view if hammocks could be slung in two horizontal planes alternately; we should then have a far better and more rapid diffusion of fresh air among the sleepers. Hammock hooks might be fitted in situations which, though not constantly used for sleeping purposes, are suitable both from a medical and executive point of view, and the men encouraged to spread themselves as much as possible, especially in the tropics. Many men will not bother to move from their accustomed berthing simply because there are no facilities for slinging their hammocks elsewhere, and even in the tropics only the more intelligent ones take trouble to keep themselves "fit" by improvising billets.

What makes the question of ventilation so complicated in modern ships is that, owing to the necessity of strictly localizing damage from shell or torpedo, the ship must be a segmental organism, serially partitioned off into compartments, each one of which is capable of independent action; such an arrangement entails separate oxygen supply to each section. Landsmen do not realize that everything in a warship must be subordinated to fighting efficiency, and that it is frequently necessary to pack a whole village on to a ground plan much less than that of the village churchyard. They are surprised to learn that consumption *does* exist on the high seas, and receive a rude shock when

they realize that the average mariner's "bed-room" is less than a cube of 5 foot side.

The following Table shows some typical allowances in various walks of life:—

TABLE II.

	Allowance of cubic feet to each person.
Sick Paupers (allowance ordered by Local Government Board) ...	1,000
Ordinary healthy People	800
Soldiers—Regulation Allowance ...	600
Dormitories of Paupers (authorized by Local Government Board) ...	300
Sleeping deck in a Training Establishment, Royal Navy	290
Sick Bay, Navy	250
Prison Cells, afloat, Royal Navy ...	200
Average Mess Deck, Navy	150
Sleeping Deck, "Dreadnought" Class	86
Soldiers, Military Transport ...	80
Sleeping Deck "Formidable" Class	68

Consider for one moment the anatomy of a modern warship; it is literally honeycombed with some two or three hundred watertight cells, in most of which foul air must stagnate unless it is forcibly ejected, or fresh air forcibly injected. Inside the compartments are men—one, two, or one hundred, as the case may be—each one of whom is polluting the atmosphere by deleterious products in the form of water, CO^2 and a subtle organic poison, concerning which little is known beyond that it is absorbable by H^2SO^4. I will take by way of illustration the least noxious of the three, the aqueous vapour, and ask you to follow me in imagination into a sleeping compartment on one of our largest and most up-to-date vessels. This compartment, chosen quite haphazard, was measured, and, after making a careful allowance for all obstacles, including three cubic feet for each man, was found to have a total capacity of 6,212 cubic feet. In this space 77 men slept, hence each man's allowance was 80.6 cubic feet, and each man was, as it were, boxed up in a space with a surface area of 121 square feet. Now the surface area of a man's lungs is 323 square feet, in fact, under such circumstances we could wrap the lining membrane of the sleeper's lungs nearly three times around the space in which he slept. We will suppose the period of rest to be 8 hours; in this time each man gives off ten ounces of water, 3.4 ounces from his lungs and 6.6 ounces from his skin. Assuming the temperature to be 60°F., the air can only hold in solution 5.8 grains of water per cubic foot, consequently each person saturates during sleep 827 cubic feet of air—more than ten times his own

allowance—or, put it in another way, he saturates the air around him at the rate of 103 cubic feet per hour. The 77 men saturate 63,702 cubic feet during sleep, or at the rate of 7,963 cubic feet per hour; in other words, they saturate their allowance of air in 46 minutes. For the remaining 7 hours and 14 minutes this moisture would be evident as sweat drenching the sleeper's attire, and as "dew" deposited on all solid structures in his vicinity. Here, then, we see the imperativeness of removing the water-laden air as fast as it is produced, and supplying in its place fresh and, if possible, dry air; moreover, we gain a clue to the necessary rapidity with which such air should be supplied. Keeping to the concrete example we have selected, let us see what are the provisions for this purpose. There is a certain amount of natural ventilation, but as this is very limited and depends entirely on speed, wind, and weather, it may for the present be put out of court. There are two fans, which, when working at full speed, can deliver fresh air through twelve louvres into this sleeping place at the rate of 360,000 cubic feet per hour, thus the whole of the air is theoretically renewable every 1.03 minutes; in practice, however, it is found that the air is renewed about once in every three minutes. Not even the most rampant "fresh air fiend" could complain of an installation turning out fresh air at this rate. In his description of this particular space, the Medical Officer, Fleet Surgeon McNabb—to whom I am particularly indebted for his kindness in furnishing me with much information about the ventilation of our newest battleships[1]—says: "For my part I think this most satisfactory, my only objection being that the trunks run overhead and the louvres open on the under surface, consequently the occupant of the hammock beneath probably shuts the louvre on account of the draught. If louvres were placed on the upper surface of the trunks, where they are not close to the deck above, this would be obviated." Your bluejacket does not really object to fresh air, but he does object, and strongly, too, to a concentrated shaft of cold air playing on him all night, the result is that after rounds he surreptitiously slides back the louvre-trap, or plugs it up with cotton waste, and all the rest in the compartment suffer. That the system works satisfactorily in such a ship as the one I have been discussing is evidenced by the fact that in 7 months there were only 44 catarrhal and respiratory cases out of a complement of 840 men; in other words, of these maladies the percentage per annum was but 8.4. There is no need to labour this point further; I called as witness aqueous vapour, the least harmful of the three principal body exhalations, and I think, with its evidence alone, we have quite made out our case, but before leaving this subject I should like to say a word upon the question of carbon dioxide. The question

[1] And in this connection I am also under a deep sense of acknowledgment to Fleet Surgeon Percival M. May, R.N.

is often asked: "What percentage of CO^2 is harmful in living spaces?" and the answers received are invariably conflicting. It used to be taught that when CO^2 rose to as much as two parts per 1000 it became harmful, but two and even three parts per 1000 are by no means harmful, at any rate during rest and sleep, for it is a significant fact that a higher percentage of CO^2 can be tolerated during sleep than during activity. The probable explanation of this interesting fact lies in terms of evolution. Contrast the different atmospheric environments acting upon the majority of terrestrial animals during the day as compared with the night; in the former case they are roaming the country in search of food, in the latter, huddled together for warmth and protection; even in the case of solitary animals who avoid the society of others, much the same differences exist. There is, as a general rule, a tendency during night-time to seek holes and corners, or to curl up in "forms" and bury the flexed head in the warm furry concavity of the abdomen; in all such cases the CO^2 ratio inhaled must be much higher. Man, with all his vaunted civilization, has never completely emancipated himself from these conditions, and so it has come about, owing to selective processes acting over long vistas of time—probably since the branching off of mammals—upon the ancestors of man, that he is immune to a much higher ratio of inhaled CO^2 during sleep than during activity. Nor is phylogenetical evidence lacking on this point; the newborn child is more tolerant of a high CO^2 ratio than is the adult, and the fœtus more so than the child; again, the oxygen content of the blood diminishes progressively as we pass down the scale of terrestrial animals, being highest in the quick-breathing birds and mammals, lower in reptiles, and lowest in the plethoric amphibians. A short time ago some samples of air were taken from a box containing a cat and four kittens which was in a cupboard in a compartment where several stokers were undergoing a course of instruction, the ratio of CO^2 estimated in parts per 10,000, was, for the outside air 3, inside the room 10, and inside the box 35. Yet the whole feline family was, in lower deck phraseology, perfectly "happy and chatty," the mother purring while her offspring drew their daily allowance of rations in the orthodox kitten way. Recent investigations have shown that CO^2 *per se* is not the noxious gas it was formerly supposed to be; we swallow large quantities in aerated waters, we see coal-miners and workers in soda-water factories and breweries breathing an atmosphere richly charged with CO^2 without evil effects. Again, two thousand parts in ten thousand have been breathed without fatal results for a period of three hours, but in all these instances the CO^2 is practically pure; where we find it mixed with volatile organic and inorganic poisons we see very different results. For instance, the CO^2 given off by a gas jet is harmful when it reaches 20 parts per 10,000, and that given off by a paraffin burner is only harmful

when the air is vitated to the extent of 75 parts per 10,000. As regards living animals the much abused CO^2 can no longer be relegated to the limbo of waste products, for it is of as much direct importance to us as to our complementary organisms the plants. A certain percentage of CO^2 in the atmosphere is essential to our very existence from minute to minute; not only is it the normal stimulus to the respiratory centre, but it assists in the splitting up of oxyhaemoglobin in the tissues. If an animal is made to breathe a CO^2 free atmosphere the normal circulating CO^2 in its blood is reduced, and there results after a time a condition known as *acapnia*, in which the respiratory centre missing its customary fillip goes on strike, breathing stops, and the result may be fatal; restore, however, the due proportion of CO^2 and breathing is resumed. But although a moderate rise in the percentage of CO^2 is of itself without much significance, yet such rise when of pulmonary or cutaneous origin invariably goes hand in hand with that subtle organic poison which is really the *fons et origo* of most of the baneful effects of bad ventilation. In other words, the CO^2 is the most valuable index to the real culprit, it has, moreover, the great advantage of being a gas which can be detected with ease and measured quantitatively with great accuracy. It is not the innocent little striped pilot fish we fear, but his friend and companion the shark; when, therefore, in a living space we find a high percentage of CO^2 we know that a real enemy is lurking in our midst, and we must take immediate steps to oust him. In the absence of any analytical outfit our senses form a delicate test; Haldane says that when the air of a chamber feels oppressive and has a distinct smell, the ratio of CO^2 is certainly not lower than 10 parts per 10,000. A summary of some recent examinations of the air in a training ship may be of interest. A mean of several analyses of the air of the boys' sleeping decks, averaging about 140 boys per deck, gave a total of .012 grammes of H^2O per litre, as compared with .006 grammes per litre in the outside air. In some class-rooms, averaging about 20 boys per class, the water-vapour mean was .009 grammes per litre as compared with .006 grammes per litre in the outside air; again, in the workshops, which are very open to the air, the water-vapour was .008 grammes per litre as compared with .007 for the outside air. The CO^2 in the sleeping decks averaged .08% as compared with .04% outside, in the studies it averaged .06% as compared with .038 outside, and in the workshops it averaged .05% as compared with .035 outside. Finally, the organic matter in the air was such that to oxidise a million litres of air 7.4 litres of oxygen were required in the sleeping decks as compared with 1.9 litres outside, in the class-room 7.1 litres were required as compared with a trace outside, and in the workshop 4.1 litres were required as compared with a trace outside. As bearing on this matter the following Table shows the mean condition of the air in certain living places of a Training Establishment:—

TABLE III.

Table showing condition of air in sleeping decks of a Training Establishment.

	Sleeping Decks at 8 p.m.	Sleeping Decks at 2 a.m.	Sleeping Decks at 7 a.m.
Mean capacity in cubic feet	36.167	36,167	36,167
Mean No. of boys present	58	124	106
No. of hours present	0.2	5.0	10.0
Cubic capacity to each boy in cubic feet ...	623	291	341
Area of ventilation in square feet ...	205	232	110
CO_2 percentage inside	.05	.09	.13
Do. outside	.042	.041	.046
Oxygen required to oxidise organic matter in a million litres; inside	2.9	9.0	28.7
Do. outside	1.8	—	—
H_2O in a million litres, inside	8,600	8,400	7,300
Do. outside	7,200	5,500	7,800

The most ill-ventilated of the living compartments of modern ships are probably the dynamo rooms, because, for fighting efficiency, these places must be carefully isolated the one from the other, so that damage or disaster to one shall not necessarily throw the whole ship out of action; their high temperature is due to the inevitable steam pipes which are necessary for the production of electric power. In engineers' workshops, too, the temperature is often about 90°F.; much might be done to ameliorate the condition of the inmates of these places during working hours; in ships in which I have recently served I have suggested conveying fresh air by hose-pipe connections from those sleeping decks unoccupied during working hours, this always had beneficial results, the drop in temperature and CO_2 ratio was most striking, the men worked better and were free from the headaches to which they had been previously accustomed. We must constantly bear in mind that it is in war time—using the expression not for that brief and exciting period of hurtling shell, exploding mines, and sinking ships, but for that prolonged monotonous and anxious period of stoppage of leave, double watches, over-work, under-rest and "strain"—that the ventilating arrangements in our ships will require most careful and constant supervision; it is then that the crucial test as to their efficacy will be applied. Hear what our friends the Japanese have to say in regard to this question. Dysentery—which is very rare amongst their sailors in peace time—broke out at one of their most critical times, that is, in front of Port Arthur, and the medical officer in a subsequent report says:—"During the action almost all the hatches were closed, the temperature upon the lower decks in consequence rose considerably, not only in summer but in winter time, and this was one of the principal causes of great suffering."

HEATING ARRANGEMENTS.

The various dwelling places in ships were formerly heated by stoves and bogeys, but fortunately, from a hygienic point of view, these are disappearing rapidly throughout the Service, though they still linger on in destroyers and torpedo-boats. Under certain circumstances the heating was effected by pipes containing hot water, a cumbersome and by no means safe installation which is now almost obsolete; the prevailing method in the present day is by pipes containing steam, which are led into each compartment and connected with a radiator where the steam is brought into contact with a large area of surface, valves being fitted so that the temperature can be regulated to a nicety, the pressure averaging about 40 lbs. per square inch. I think, however, the time is not far distant when electricity will supersede steam for all heating arrangements afloat; the advantages are obvious, as the radiation of heat can be localized to the exact situation where it is required. With the use of steam for this purpose, there has, of course, to be an immense labyrinthine circuit of pipes between the boiler and radiator, entailing enormous waste and the heating of parts of the ships where heat is not required. Consider, too, the endless trouble which steam-pipes give with their leaky joints and defective valves. Contrast the effects of a shell through a steam-pipe containing steam under a pressure of 40 lbs. per square inch with those resulting from a similar break in the electric wire to a radiator. If any proof were wanted, which I do not for a moment think to be the case, that electric radiators have come to stay I should like to point to the fact that there are on the city mains of London at the present moment more than 5,000 electric radiators. In the super-Dreadnoughts the air is passed through tanks containing pipes in which is steam under pressure, which both warms and dries the air; this is an excellent system in more ways than one, for not only is good dry air supplied and the dew deposition lessened, but, owing to the fact that the air is not cold, "draughts" are not felt, and there is much less tendency on the part of the men to interfere with the peripheral outlets, there is less liability, too, to the "catching" of colds.

COOLING ARRANGEMENTS.

Of course it is almost as important to supply cool air in the tropics as it is to supply warmed air in cold latitudes, although at present we have only reached the stage of supplying cooled air to magazines and, in a few instances, to meat stores. Steam-power transmission is gradually giving way to electrical transmission of power, and this leads to a lessening of steam-pipes, a lowered temperature and higher oxygen ratio. Another very great advantage of electricity, in so far as the lighting of the ship is concerned, is that, though it slightly heats the surrounding air, no gases are given off and no oxygen is absorbed.

DRYING ARRANGEMENTS.

A typical drying-room should be heated by a closed circuit of steam-pipes arranged around the chamber, the vaporized water from the wet clothes being simultaneously rapidly extracted and expelled by means of powerful exhaust fans in uptake trunks; the use of stoves for drying air is not, in my opinion, satisfactory, as they invariably allow of the escape of products of combustion into the chamber. The best test of the efficacy or otherwise of a drying-room is to allow the room to cool, and if then on the various partitions moisture condenses, the exhausts are insufficient; in one ship in which I served there were two 6-inch exhaust pipes leading from the drying-room into the funnel casing, but these were found totally insufficient for the removal of all the moisture. Wet decks, washplaces, sea-spray, pulmonary and cutaneous exhalations, all conspire to bring about that state of atmosphere which results in dew deposition upon the metal sides and tops of living spaces. The older plan was to increase the area of surface by painting in bits of cork, which were then covered over with white zinc enamel; true, the greater area of surface gave greater facilities for evaporation, but at the same time there were increased facilities for the lodgment of dirt and dust in the crevices, and moreover, a brambled surface is much more difficult to clean than a smooth one. The modern tendency is to give the sides and roof of compartments a smooth surface and to rely more on good dry ventilation; which after all is the best prophylactic against dew deposition. Another custom fraught with the gravest dangers is happily dying a natural death; I allude to the perpetual scrubbing and holy-stoning of decks other than the open-air upper decks, and to the use of deck-cloths, which simply foster dampness. In the super-Dreadnoughts all decks are corticened and painted over with red lead and shellac, the result is a polished surface which can be kept clean by sweeping and by rubbing over with a damp cloth; however, corticene wants constant care as, unless quite sound, water is liable to collect underneath, stagnate and give off a foul smell. Perhaps in the near future we shall see corticene give way to the simple application of a thick rubber-like paste directly to the deck. There can be no doubt that the large quantities of water used in scrubbing the between-decks is a fruitful source of sickness in the tropics, since organic matter is thus triturated and left to dry and disseminate; moreover, the tendency to produce a saturated atmosphere is to be deprecated, as such a condition is highly undesirable whether it occurs in the tropics or at home; in the former it is dangerous to life because of the consequent inability of the person to lower his own temperature by sweat-evaporation, in the latter it predisposes to chills, bronchitis, influenza, and pneumonia, owing to the facility and rapidity of conduction and radiation of heat in a water-laden atmosphere.

CLOTHING.

Masts, yards, and sails are relics of the dim and distant past, coal and steam are now dominant, oil and electricity have placed a foot in the doorway and are clamouring for recognition. Has the clothing of our sailors, especially of the engine-room branch, adapted itself to these changes? One point in our sailors' clothing, in my opinion, calls for comment, I allude to the V-shaped opening in the "jumper," which leaves somewhat unprotected the most delicate region of the lungs. A very large number of men provide themselves at their own expense with singlets, which they wear under the Service flannel; I think the difficulty could be surmounted by making the flannel of double thickness opposite the V opening. While on this subject it is gratifying to note that steam disinfectors for clothing are now being installed in all the larger ships.

FOOD.

The most captious critic cannot complain of either the quantity or quality of the food allowed the bluejacket in piping times of peace. Were I to offer any comment in this connection, it would be that the food, or, to be more precise, the "feeding" of the average sailor is perhaps too liberal. How many of us have seen cases of loss of health owing to deficiency of food in the Navy? None; but most of us are familiar with ailments that follow in the wake of over-taxed organs incident to over-ingestion, especially of proteids. The quantity of physical energy as represented in daily foot-tons of work put out by the seaman class of to-day is much less than in the days of masts and yards, yet the nutritive value and quantity of his food has steadily increased; in the case of stokers this argument perhaps does not yet apply, though we are beginning to see a tendency to the adoption of labour-saving devices even in the stoke-hold. In war, of course, food will neither be so abundant nor so fresh, whilst labour will necessarily be increased and rest diminished. It is absolutely essential to have a correct ratio of carbo-hydrates and proteids in any system of diet if we want to have correct metabolism, and the naval scale of diet has been well thought out in this respect. The drinking water supplied afloat is of the best, being distilled and therefore sterilized, but such water is a very expensive beverage, and so "shore-going" water is used where it is above reproach. I think it would be very much to the good of the Service if more filters of the Pasteur Chamberland type were installed. The quantity of water used in the navy for drinking and cooking purposes is about a gallon per head per day, for clothes two gallons weekly per head, and for all purposes it averages 50 gallons per head per week.

The custom of granting an allowance in lieu of rum is a good one, and a steadily increasing ratio of men take up savings

in this way each year; but although in all ships there is inevitable waste of good food—especially bread—it is difficult to see how this custom could be extended to food without entailing grave consequences. The Japanese reaped bitterly of their experiences when they allowed ships to provision according to the individual tastes of the crew, as the men—with a view to saving money—fed themselves exclusively on rice, and an outbreak of beri-beri resulted, which stopped for ever the system of individual provisioning.

I think the time is not far distant when we shall see electricity supersede coal for cooking purposes, and I am sure this change will be welcomed equally by executives, doctors, and the ship's company. Consider the dirt, the labour, the increase and duplication of storage room, the waste of time in lighting up and dousing, the heat waste, the smoke and CO_2 production that are the inevitable attendants upon the use of coal in galleys, all these will disappear in the days of electric cooking, which must come even on men-of-war. The following facts will bear witness to the practicability and economy of electricity for both cooking and heating purposes. Quite recently 4,000 meals cooked by electricity were served in a period of 11 days; the current used during this time, including that for radiators, lamps, and electric potato peelers, was 3,600 units, or less than one unit per person fed. In Marylebone 500 people were daily provided with a substantial cooked meal at 4d per head.

Just a word on the question of rum and tobacco. Speaking purely as a doctor—and I think the majority of medical men will agree with me—I should like to see the ration of rum served out in the evening hours, after the day's work is over, rather than in the middle of the day. The Service tobacco is notoriously good, but notoriously strong, and we cannot hoodwink the fact that a certain amount of defective vision in the navy is due to excessive smoking and chewing of strong tobacco, aided and augmented no doubt by cheap cigarettes. Eyes demand special care in the Navy, since the visual acuteness of guns' crews may have a considerable influence in determining the results of a battle. As minor agencies in the production of defective eyesight afloat, we must guard against the injudicious use of the eyes in connection with electric lights, arc lights, and furnace fires; again, the pernicious habit the bluejacket has of making his tea into a decoction instead of an infusion is not only coadjuvant to the production of defective eyesight, but, in addition, is at the bottom of a great many gastro-intestinal disorders. Nothing but education will eradicate any of these deplorable habits.

Before quitting the subject of food may I pass a brief remark upon the question of the hygiene of the mouth. When first I entered the Service the proportion of men who made daily use of the tooth-brush was infinitesimal; it is now the custom in Training Establishments for seamen and stokers to make the

tooth-brush a compulsory part of the kit, and its use a compulsory part of the daily routine. Later on, when this custom becomes voluntary, about 50 per cent. of the men still keep up the daily use of the tooth-brush.

SANITATION—DRAINING ARRANGEMENTS.

The old main drain that ran lengthwise through the ship and drained the various compartments has given place to a series of separate drainage systems, each of which has its own centrifugal pumping apparatus. The sulphides of ammonia and hydrogen that emanated from the drains of the older ships are never met with now.

LATRINES.

In the newer types of our larger ships the men's "heads" are situated right aft on the main deck, a situation that from a medical point of view leaves nothing to be desired, they are tiled and therefore easily cleaned, and are fitted with two fans which keep the air fresh. The discharge-pipes no longer terminate in the old-fashioned cess-pool, which was opened only at stated times, but run down through the skin of the ship into a main pipe which has an exit about a foot below the water-line, and which is kept perfectly sweet by a constantly circulating supply of water.

In the French Navy the water for flushing the "heads" is mixed with electrolyzed sea-water. The water for this purpose is kept in tanks of 30 c.c. side, which are coated inside with gutta-percha, and through these from 70 to 80 volts daily are passed; this liberates ozone and chlorine—about 12 c.c. of the latter are dissolved in a litre of the electrolytic fluid. The apparatus can be easily installed, and the necessary expense is negligible, the actual cost of making a gallon of electrolytic disinfectant is about one penny.

Nothing is more horrible than the custom of spitting about the decks, which, however, of late years is much less in evidence than it was. Again, the use of mess kettles in the scrubbing of decks cannot be too strongly condemned, and to prevent this there should be a plentiful provision of buckets on board. Undoubtedly the presence of organic matter on the decks is one of the main causes of the frequent boils in the neighbourhood of the knees; constant supervision in the matter is the only remedy.

WORK.

The daily number of foot-tons of work put forth by the sailor in pre-Nelsonian days was of necessity much more than in the present, and presumably it will suffer a still further diminution in the not-distant future. The sailor, in a word, is adapting himself to a new environment, in which he must rely more and

more upon intelligence, and less and less upon muscle. The physique of a man is to a great extent a reflex of his environment. I have at various times made anthropometrical measurements of the three main branches of the Service—engine-room, seaman, and marine—and comparisons of these have brought to light some interesting facts; for instance, the weight (W) in pounds of a seaman (S) is to that of a marine (M) is to that of a stoker (Sto.) as 137 : 141 : 144, that is :—

W.S. : W.M. : W.Sto. : : 93 : 96 : 100.

Again, the height (H) in inches of a seaman is to the height of a stoker is to the height of a marine as 66.1 : 67.7 : 68.6, that is :—

H.S. : H.Sto. : H.M. : : 96.3 : 98.6 : 100.

Again, the chest girth (C) in inches of the marine is to the chest girth of the seaman is to the chest girth of the stoker as

33.83 : 34.62 : 34.85, that is :—

C.M. : C.S. : C.Sto. : : 97.0 : 99.3 : 100.

The mean circumference of the two thighs and forelegs (X) (upper limbs) in inches for these three ratings is shown thus :—

Sto. : Marine : Seaman : : 10.6 : 10.7 : 10.8, that is :—

x.Sto. : x.M. : x.S. : : 98.1 : 99 : 100.

The mean circumference of the two thighs and forelegs (X) (lower limbs) in inches for the three ratings is :—

Marine : Seamen : Stoker : : 16.6 : 16.7 : 17.0, that is :—

X.M. : X.S. : X.Sto. : : 97.6 : 98.2 : 100.

The mean of all four limbs (xX) is :—

x.X.M. : x.X.Sto. : x.X.S. : : 99.1 : 99.8 : 100.

Mean strength (p) of right and left grip in *lbs.* for the three ratings is :—

Marine : Seaman : Stoker : : 80.7 : 86.3 : 87.3, or

p.M. : p.S. : p.Sto. : : 92.4 : 98.8 : 100.

Mean strength of pull (P) in *lbs.* of the two arms for the three ratings is :—

Stoker : Marine : Seaman : : 94 : 96 : 97, or

P.Sto. : P.M. : P.S. : : 96.9 : 98.9 : 100.

from which we see that the mean strength (p.P.) for all purposes in these ratings is :—

Marine ; Stoker : Seaman : : 95.6 : 98.4 : 99.4, or

p.P.M. : p.P.Sto. : p.P.S. : : 96.2 : 98.9 : 100.

If we compare the muscular development of the right and left upper extremities in these three ratings, we find that the left upper extremity of the stoker is larger than that of the marine or seaman, and approximates more to the dimensions of the right arm than in the case of the other two ratings. As regards the strength of the hands, the left is actually stronger than the right in the stoker branch, though neither is as strong as the seaman's grip.

Mean Arm Circumference	*Seaman*	*Stoker*	*Marine*
Right	10.91	10.88	10.84
Left	10.73	10.77	10.69
Mean grip in lbs.			
Right	88.96	86.54	83.91
Left	88.30	87.27	80.75

In other words we have for upper extremities :—

Right—Mar. : Sto. : Sea. :: 99.3 : 99.7 : 100
Left—Mar. : Sto. : Sea. :: 99.2 : 99.6 : 100

for grip :—

Right—Mar. : Sto. : Sea. :: 94.3 : 97.2 : 100
Left—Mar. : Sto. : Sea. :: 98.8 : 99.6 : 100

I think the explanation of this over-development of the stoker's left arm is to be found in his use of the shovel. Anyone who watches the operation of stoking will notice that the shovel as held by the stoker when he faces the furnace forms a lever turning about a fulcrum, such fulcrum being the left hand as it grips the shovel. Upon the short arm of this lever a force—due to the weight of the coal—acts vertically downwards, whilst upon the long arm of the lever a balancing force exerted by the right arm acts vertically downwards. The resultant of these forces is transmitted to the ground through the muscles of the left arm, causing their enlargement.

Another noteworthy fact elucidated was that vertical growth in the seaman class ceases abruptly about the age of 19, although horizontal growth and increase in weight continue until the age of 25. I attribute this cessation of *vertical* growth and continuance of *lateral* growth to the custom of sleeping in hammocks at that early period of life when growth should be most active. The position of the sleeper is such that the long axis of his body forms a curve lying in a vertical plane, hence the bones of the lower extremities and vertebral column are in a constant though slight condition of *longitudinal* compression, which prevents in the parts compressed that free circulation of the blood and lymph from which the growing tissues extract the bricks and mortar wherewith to add to their bulk. It is well known that increased stature follows a prolonged confinement

upon a flat bed, and that a 6ft. man at breakfast is by no means a 6ft. man at dinner; a would-be recruit who is dangerously near the border line can, by taking thought, add an inch to his stature if he lies perfectly flat for some hours previous to the examination. Again it is significant that the marine, though lowest in chest girth, is highest in stature of all Service ratings; now the marine does not adopt hammock life until a much later age than the other branches, moreover he has long interregna in barracks, when he sleeps on an ordinary bed.

The following Table shows the comparative rapidity of vertical and horizontal growth in boy artificers who take to hammock life before they are 16 years of age.

TABLE IV.

Table showing comparison between proportionate increase in vertical and horizontal growth in boy artificers.

—	On Entry.	On Leaving.	Total Gain.	Gain per annum.
Mean age in years	15·82	19·72	3·90	1·00
Mean weight in pounds ...	108·84	135·90	27·06	6·93
Mean height in inches ...	63·90	67·17	3·27	0·83
Mean chest girth in inches ...	32·25	35·65	3·40	0·87
Mean brain weight in ounces	47·46	49·29	1·83	0·46
Do. grammes	1344	1398	54	13·84

TABLE V.

Table showing percentage of disease *plus* injuries in the various classes of ships during the year 1910 on the Home Station.

Class of Ship.	Mean Tonnag.	No. of ships from which data are taken.	Total No. of days in commission.	Total No. of cases of disease and injury.	Cases sick per cent. of complement
Submarines and their Depôts ...	—	63	2,190	981	40·70
Destroyers and their Depôts... ...	966	121	3,144	3,906	42·59
"Achilles" and "Defence" class ...	13,900	6	2,190	1,966	45·93
Gunboats	776	9	2,664	269	46·37
"Dido" and "Bristol" Class ...	5,200	8	1,773	971	54·55
"Hogue" Class	12,000	4	890	758	56·77
"Bellerophon" and "Collingwood" Class	18,778	7	2,235	2,798	62·24
"Blanche" and "Apollo" Class ...	3,387	12	2,870	844	62·51
"King Edward VII." Class	16,350	8	2,920	3,765	65·08
"Indomitable" and "Agamemnon" Class	16,950	5	1,825	2,208	65·91
Scouts	2,838	8	2,920	1,293	66·13
"Antrim" Class	10,850	5	1,825	1,574	68·73
"Cæsar" Class...	14,900	8	2,920	2,706	71·49

TABLE VI.

Table showing distribution of diseases in the Navy.

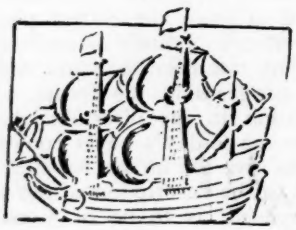
DISEASE.	Number of cases 1910.	Ratio per cent. of strength 1910.	Ratio per cent. of strength for preceding 5 years.	Ratio per cent. and Station showing lowest returns.		Ratio per cent. and Station showing highest returns.	
Dysentery	77	0·067	0·051	0·0	Mediterranean	0·95	E. Indies
Alcoholism ...	96	0·084	0·100	0·0	E. Indies	0·13	Irregular
Typhoid Fever ...	162	0·142	0·153	0·0	Australia	0·65	E. Indies
Tubercle	261	0·229	0·298	0·19	Cape	0·27	China
Pyrexia	296	0·260	0·443	0·01	Home	3·55	E. Indies
Lymphatic System	449	0·309	0·509	0·27	Home	1·04	Cape
Pneumonia ..	519	0·457	0·443	0·19	Cape	0·75	Home
Malaria	597	0·525	0·492	0·03	Australia	16·05	E. Indies
Circulatory ...	676	0·595	0·575	0·41	Home Fleet	0·84	Home
Nose and Ear ...	689	0·606	0·554	0·28	Cape	1·09	Home
Nervous	840	0·739	0.783	0·47	Cape	1·06	Home
Eye	897	0·790	0·778	0·19	Cape	1·16	Home
Genito-Urinary ..	939	0·827	0·797	0·56	N. America	1·23	Cape
Rheumatism ...	969	0·853	0·450	0·42	China	1·27	Home
Infectious	1,489	1·311	0·777	0·22	Home	5·78	Australia
Influenza	2,049	1·804	2·564	0·19	Cape	3·20	Australia
All other diseases	2,165	1·906	2·620	—	—	—	—
Parasites	3,241	2·854	3·585	0·55	E. Indies	4·79	Home
Respiratory ..	7,683	6·767	7·059	4·07	Australia	10·59	Home
Skin	8,656	7·624	9·212	3·62	Cape	19·95	E. Indies
Digestive	12,104	10·661	10·455	8·03	Home	16·45	E. Indies
Venereal	13,402	11·804	12·193	8·15	N. America	15·43	China
Total ...	58,256	51·133	54·891	—	—	—	—

And now, Gentlemen, we have completed our survey, fragmentary though it necessarily is in a subject of such vast scope. I should like in conclusion to posit the question "What is the future outlook for Naval Hygiene?" I think it must be acknowledged that, looked at from the correct perspective, the past evolution of this particular branch of medical science, if somewhat slow, has at any rate been sure and steady, and signs are not wanting that progress in the future will show an ever-increasing acceleration in the direction of perfection. As I write I have before me to-day's paper containing a paragraph which cannot fail to give the utmost satisfaction to every naval surgeon. I allude to the description of our next hospital ship, which, when completed, is to be of 5,000 tons, fitted with turbines, wireless installation, electric surgical lifts, operating theatres, bacteriological laboratories, dark rooms, padded rooms, isolation wards, steam laundry, and disinfector, sterilizers and incinerators; in a word, it is to be a thorough up-to-date floating hospital. We must always remember that, if we are to have the truest, most stable, and therefore the best form of progress, we must, like Dame Nature, move carefully and cautiously, sifting and testing many and diverse opinions and suggestions, select-

ing here, rejecting there, so that the fittest of these opinions and suggestions survive. We must be prepared to meet at one extreme those who, always content with existing even if old fashioned methods, are steadfastly opposed to all change, and at the other extreme those who incessantly clamour for the introduction of every innovation whether or not proved by the test of time. Which of these two sets of advocates is right? Both are right and both are wrong. Each is the necessary counterpoise of the other, take away either and there remains, in the one case a slough of stagnation, in the other case, chaos. It is but a chapter, nay, but a page, in that old, old story of the everwaging war between what in the social world we call radicalism and conservatism, in the organic world, variation and heredity, and in the sub-organic world attraction and repulsion.

At the back of all phenomena, from the eternal dance of electrons within the atom to the evanescent flux of humanity across our planet's stage, is an ultimate and inexplicable *push* and *pull*. And so we count that man wise who, while recognizing the indispensability of extremists on either side, holds himself aloof, and, like the helmsman of old, steers his craft through the stormy waters of disputation, avoiding on the one hand the rock of obstruction and on the other the whirlpool of revolution.

"Durch Schaden wird man klug."



COURTS MARTIAL OF THE PENINSULAR WAR, 1809-14.

By Professor C. Oman.

On Wednesday, November 20th, 1912.

The Judge-Advocate General in the Chair.

THE study of great campaigns, as a part of the history of the art of war, or of the history of England, inevitably leads the student into many by-paths and side alleys, through which he has to stray for information that will be useful to him for the comprehension of the annals with which he is concerned. It will often be the case that ninety-nine hundredths of the facts which he there collects and tabulates will be of no service to him for his main task. But they remain as an accumulation of small historical notes, not without their value and interest, and it may sometimes be worth while to set forth the contents of some section of them in the form of a monograph.

While studying the organization of Wellington's army for a recently-published book, I had naturally to devote a good deal of attention to its discipline, and its system of rewards and punishments. With this object I soon found myself involved in the making of an analysis of the General Courts Martial of the Peninsular army, as set forth in the volumes of Wellington's "General Orders," which record from day to day each trial and its results. The immense tabular picture of the crime of the army thereby produced is, of course, incomplete, because it takes no note of the regimental courts martial, which dealt with all the minor offences, and awarded the minor punishments. In addition to the cases with which I shall be perhaps surfeiting your ears to-day, you must presuppose any amount of minor offences, which were, by the military code, not too heinous to be dealt with inside the battalion: drunkenness most of all, minor acts of indiscipline or disobedience, petty theft, malingering, and so forth, which had their appropriate penalties in the way of stoppages, degradation to the ranks, or lashes, in numbers which (though often heavy enough in themselves) were trifling to the sentences which the general court martial could award. Of these things there is no accessible and complete record, many battalion books having perished or gone astray. But the General Courts Martial, an enormous body of evidence in themselves, had their results recorded year by year, with such an amount of detail that it is possible to make out in nearly every case, not merely the charge and the sentence, but

also the main features of the case. I know no other bulk of material from which it is possible to construct such a complete survey of the crime of the British Army during the eventful years of 1809-1814.

A General Court Martial was convened, as the official verbiage always goes, "by virtue of a warrant and in pursuance of an order from his Excellency the Commander of the Forces," which warrant named the President, and in the early years of the war always specified the number of the members, and the units of the army from which they were to be drawn. The President seems invariably to have been a brigadier, and therefore usually a major-general. But where a division was short of major-generals, owing to their sickness or absence on leave (so that their brigades were being, in fact, commanded by the senior colonels actually present), a colonel in interim charge of a brigade not infrequently took his place as President of a General Court Martial. On one or two occasions the Military Governor of Lisbon (Col. Peacocke) takes up the post. The number of members in the warrants of 1809 seems nearly always to be 14, but the rank of the officers varies much. On the first General Court Martial on record in Wellington's army, at which General Rowland Hill presided, there were four field officers, six captains, and four subalterns, but in later instances I find varieties, such as five field officers and nine captains, with no subalterns, or again, six field officers, six captains, and two subalterns. It would appear to have been during 1809-1810, more usual than not to draw the members from several divisions, as many as three or four, so that it was certain that each brigade would have to provide no more than one or two members. But when a part of the army was long detached from the rest (as was, for example, the 2nd Division under Hill in Estremadura in 1810-11-12) a single division might be ordered to find the whole 14. The same was often the case in winter quarters, when the different divisions had been cantoned at great distances from each other, so that the passing of officers to distant camps for assembly would have been inconvenient. In fact, during the later years of the war, it seems almost to have been the rule for a general court martial to have been recruited from a single division only, rather than from several. Having once assembled, the first duty of the body was to appoint an acting Deputy-Judge-Advocate, to act as its agent. It is clear that he was chosen for a real or supposed knowledge of form and procedure, as we repeatedly find the names of the same officers recurring, again and again, as Deputy-Judge-Advocate when their division has to produce the members of a court martial. The body tried all cases which had accumulated since the last sitting of a similar court, which might be many or few. Sometimes its work was over in a day; sometimes (when the army was stationary or in winter quarters) it might be continued by adjournments for as much

as a month. Its verdicts, generally written out at considerable length, were sent to the Commander of the Forces for his approval, without which they had no force. Wellington used normally to pass them without comment, but occasionally modified them in various ways. Now and then he pardoned a man condemned, often in consideration of recent good service of his regiment in the field; more frequently he reduced a sentence. On the other hand, he was sometimes dissatisfied with the terms used or the verdict given, and would send back a case with his comments for the further consideration of the court martial. But this was rare. His general dissatisfaction with the careless drafting of charges, and the confused and sometimes ungrammatical wording of sentences, led Wellington in 1812 to requisition from home a trained lawyer, Mr. Francis Larpent, who served as Judge-Advocate-General on his staff for the rest of the war, and has left a rather interesting, if not always quite discreet, account of his duties and adventures. After his arrival at the front all the charge-sheets came before him, and were re-drafted under his superintendence.

It is not, however, of the forms or procedure of courts martial that I intend to speak here to-day; with the Judge-Advocate-General of to-day in the Chair, I feel presumptuous in even naming them. My real interest lies in the classes of crime that came before the courts, and in the ways which were used in dealing with them.

The first main division necessarily lies between the courts martial on officers and those on the men. The former, of course, are the less numerous, but the more interesting. There appear to be (by the best of my counting) about 60 on combatant officers, to which we may add 22 more on surgeons, commissariat officers, and other persons holding a commission.

Looking down the charges on which these 80 odd trials were held, we soon come to general conclusions. To start with the supreme military offences; there is no single trial for desertion to the enemy—a thing hardly known in the British Army at any date, the few exceptions lying in the American War of Independence, 1775-82, which was in some degree a civil war rather than a struggle of the ordinary sort. On the other hand, desertions by officers from the French Army were not at all uncommon; this came partly from the polyglot character of the mass of troops swept into Napoleon's army—Germans, Swiss, Poles, Dutch, etc.—partly from political causes, the temptation to royalists or other malcontents to desert colours under which they served unwillingly. I may mention as typical of the two classes respectively, the desertion of the Swiss Colonel Jonimi, the well-known writer on strategical topics, from Napoleon's staff in 1813, and the still better remembered treason of Bourmont (general of division), on the eve of Ligny, in the campaign of 1815. The arrival of a French officer at the English outposts was by no means an unknown thing in the

Peninsular War. There is only one instance of the sort on the British side, and that led to no court martial, though the culprit was recaptured. Lieutenant Richard Burke, of the 45th, absconded to the French camp while Masséna was lying at Santarem in February, 1811. He was insane, or suffering from delusions, and was taken a month later during the French retreat across Portugal, wandering in an objectless way in the rear of the enemy's column. After examination, in which he gave wild and unsatisfactory replies, he was sent to a madhouse.

Cowardice or shirking in the field was a very rare offence, but we find it imputed in some eight cases. Four of these belong to the famous panic in the camp on the day of the battle of Talavera, when (on a false rumour of defeat) certain persons, nearly all non-combatant officers, took to flight along with the Spanish fugitives, and in some cases did not stop till they reached the gates of Badajoz. A commissary and a paymaster were dismissed the service, and a surgeon and a second paymaster punished by a less heavy sentence, for taking part in this bolt. There are actually only two convictions for shirking against combatant officers during the whole war. In both cases the person accused had, not once, but repeatedly, disappeared from his regiment when heavy fighting was expected, and had turned up again (without medical certificate or any other excuse) some time after it had ended. One of these two officers was such a noted absentee that Wellington put a direction in general orders that "The commanding officer at Lisbon (or the commanding officer at any station where Captain —— of the —th may be found) will proceed to place that officer under arrest, and send him to join his regiment, he having been absent for several months without leave.[1]" The sentence which cashiered him stated that during the fighting before and after Vittoria he "absented himself during a period in the whole of which his corps was engaged in the most arduous and active service in the presence of the enemy, of which he could not have been ignorant at the time, rendering his absence without leave at such a moment doubly culpable, and coupled with his conduct on some former occasions raising the suspicion that it was intentional." The loose drafting of the last clause drew down some animadversions from Wellington, but (as the note on the case remarks) the circumstances detailed in evidence were of such a nature as to preclude favourable consideration.

Quite distinct from instances of actual cowardice, but linking on to it, through malingering, are the cases of the officers who were generally known as the "Belemites," or "Belem Rangers," from the name of the general depôt at the Convent of Belem, in the suburbs of Lisbon. This was the headquarters of all officers absent from the front as convalescents, or on short leave, and the limited proportion of them who lingered there

[1] See General Orders collected pp. 206-07.

too long, from a dislike of the hardships of campaigning and a love for the gaming houses and other sordid delights of the Portuguese capital were named from it. Generally they only needed to be routed up, a strong hint sufficed; but some were shameless, and came to grief.

By far the largest class, in the list of offences which brought officers to a court martial, is that which may be lumped together under the general head of breaches of discipline, by which I mean not only insubordinate conduct of inferiors to superiors, but oppressive or insulting acts of superiors toward inferiors, as well as all deliberate neglect of daily duty. There are between 30 and 40 trials turning on this kind of conduct. A great number of them are cases of officers who are accused of behaving with insolence to their immediate commanders, a fault reaching from every rank of the military hierarchy, for there is one trial of a colonel who was convicted of writing intemperate and improper letters to his divisional general, and who suffered the humiliation, by Wellington's order, of having his reprimand read out publicly to the whole division on parade. The Commander-in-Chief's remarks were decidedly scathing, and must have been hard to bear by a man so contentious as Colonel Basil Cochrane, who was the person in question. The angry interchange of letters between him and General Campbell had turned (I may mention) on the relative shares of blame to be distributed between them as to the escape of Brennier and the garrison of Almeida, which Campbell's division had been blockading.

If the prosecutions of insubordinate colonels are few, those of insubordinate captains, lieutenants, and ensigns are many. In some cases the facts alleged are very odd, and seem to bear witness to a very lax state of discipline in the regiment. Perhaps the most surprising is the charge against Captain L'Estrange, of the Buffs, "for persistently refusing to come on parade dressed like an officer on various days between 27th February and 17th May, 1812, and finally, on the last day named, having obstinately refused to quit the parade and go to his quarters when desired to do so by his colonel, in consequence of his having again appeared improperly dressed, on which occasion he used disrespectful, violent and threatening language to his commanding officer, purporting to give him a challenge, thereby" (as is added with some otiosity) "setting a determined example of insubordination to the whole corps." All of this except the challenge was found to be proved, and L'Estrange was cashiered.

In some other cases the insubordination was held to have been so much provoked by the arbitrary and offensive behaviour of the superior that the accused gets off with a light sentence of reprimand; thus did *e.g.*, a lieutenant of the 88th, who at mess told his major (in temporary command of the regiment) that he did not desire his acquaintance or acknowledge him as

being in authority over him. The court let him off with a suspension of pay, "in consideration of the extremely irritating language which he had received from Major —— without his having in any degree whatsoever provoked him." There are a good many cases of this sort, in which a charge of insubordination merely amounted to a junior "answering back" when bullied by a senior. Wellington not infrequently got provoked at seeing the time of courts martial wasted on trials of this sort. On one occasion he wrote:—

"I cannot but consider the transaction which has been the subject of this court martial as simply a private quarrel; it has little connection with the public service, or the discipline and subordination of the army, as any that has ever come under my notice. It is certainly true that the private quarrels of officers may be proper subjects for the investigation of a court martial. But the complainant, in order to obtain a decision in his favour, must come with a fair case. He must not himself have been guilty of any breach of the general orders of the army, or of discipline. His authority as a superior must not have been exercised over his inferior in order to enjoy the advantage of his own improper conduct. Above all, he must have refrained from the use of abusive or improper language and gestures.[1]"

Another comment runs as follows:—

"The Commander of the Forces cannot but feel that both his time and that of the officers comprising courts martial is occupied very little to the advantage of the public service, in considering the unbecoming and ungentlemanlike behaviour of two officers to each other.[2]"

Trials of superiors for persistent oppression of inferiors are not so numerous as those of inferiors for insubordinate action or language to superiors. The most notable one is that of Colonel Archdall, of the 46th, in 1813, cashiered for habitual use of intemperate and improper language toward his officers, combined with violent and illegal exaggeration of punishments on his men.[3] It was his pleasant habit to save up several small sentences pronounced on one of the rank and file, and then inflict them all at once; also to pronounce and execute on his own authority, and without a trial, punishments which ought by all rules to have been awarded only by a proper regimental court martial. There were, as several contemporary diaries reveal to us, other cases of tyrannical commanding officers, but this was considered the most shocking instance of the kind, and was the only one which led to the summary removal from the army of an officer so high in rank as a colonel.

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1 General Orders, September 20th, 1813.

2 General Orders, February 24th, 1814.

3 General Orders, July 3rd, 1813.

The minor breaches of discipline which fall into the category that we are considering are not of so much importance or interest, they include such offences as leaving, for many hours, a convoy of which the accused was in charge; of negligently permitting men to straggle or to plunder, and of short absences without leave, or taking quarters (for convenience sake) to which the intruder had no right, or which removed him far from his regiment. These were mostly trivial cases, which met no further punishment than a reprimand, or a short suspension from pay.

More notable, as illustrating a well-known weakness of the old Peninsular army, are the cases where an officer got into trouble directly or indirectly from drink. The courts martial dealing with such cases, about a dozen in number, fall into two sections. One, the less frequent, was that of actual drunkenness on duty, which was always dealt with heavily, and might lead to cashiering. The other, and more numerous, section turned on what we may call the indirect results of liquor, such as brawling in the streets with civilians or Portuguese officers, resisting arrest, and unseemly public exhibitions of riotous indecorum. The worst case of this kind was that of three young officers who, returning to their quarters after a debauch, found the dead body of a priest laid out in state, with candles and other trappings, in the room next to that in which they were to sleep. They mishandled it and cast it out, breaking the candles and stripping off the vestments in which the corpse was habited.[1] This disgusting freak was apparently caused by drunken resentment at finding a "*chambre ardente*" contrived next to their bedroom. They were all (very rightly) cashiered.

Wellington, in approving their sentence, adds some obvious remarks about the noxious effects of liquor—"which not only makes men incapable of performing their duty, but renders them unaware of the nature and effect of their actions."

More absurd and less disgraceful cases are those of a deputy assistant commissary general, who ran amuck through the town of Peniche, insulted the Portuguese governor, beat some militiamen, broke open the door of a chapel, and pelted the inhabitants with stones, while "roaring through the streets," as his indictment phrases it. He got off very lightly with a public reprimand and three months' suspension from pay. Wellington thought the sentence too light, and appended a note that "he had seldom read the details of an officer's conduct which had given him so much cause for disgust."[2] A cornet of dragoons got the much heavier sentence of cashiering for sharing in a debauch with some private soldiers of his own regiment, and being arrested along with them "in a state of extreme

[1] General Orders, Santa Marinha, March 25th, 1811.

[2] General Orders, November 16th, 1811.

inebriety," and making use of very improper and offensive language.[1] The same punishment of dismissal from the army was inflicted on a lieutenant of artillery drivers, for disgraceful riot in the house of a priest at Lamego, where he wilfully broke the furniture, doors, and windows, beat the servants, and locked up one of the family in a room for some hours.

A small section of courts martial on duellists must be mentioned. The number of them is much smaller than might have been expected, when we reflect on their great prevalence in Ireland and India about the same time. There are only four recorded, all resulting in deaths; and though it is clear that many "affairs of honour" which did not lead to fatal results could be, and were, hushed up, the general evidence of diaries and books of reminiscences unites to prove that duelling was rare. Wellington himself, though he long afterwards was foolish enough to "go out" with Lord Winchelsea, in 1829, set his face against duels on active service, because he could not afford to lose good officers. Commanding officers of regiments often took the greatest pains to prevent silly mess-room quarrels, or hasty words of impertinence leading to a fatal result. I find in one set of collected papers a complete file of letters between a colonel and two quarrelsome officers, whom he finally dissuaded from fighting, by getting the one to put on paper that "he was betrayed in a moment of intoxication into insulting words," and the other to write that the countercharge with which he replied was "made in a moment of great irritation and passion." These not too convincing pair of apologies were passed as sufficient, and no duel followed.[2]

When a fatal meeting did take place, the proceedings of the court martial that followed seems to have partaken of the nature of a solemn farce. Lieutenant A. was charged with killing Lieutenant B., but no evidence of the fact was forthcoming, because the seconds were always under arrest and about to be put on their trial immediately after their principals. Hence, for want of evidence, the trial dropped through; on one occasion the court martial "gave itself away" by adding a rider that "from the dying words of the late Captain L. blame was alone attached to himself." When the seconds came to be tried, they were invariably acquitted in the same fashion. Military feeling was evidently set against bringing in a conviction for murder, though professional duellists were detested.

We have now exhausted the list of ordinary types of offences which led to courts martial, save for one sort, those which may be lumped under the head of financial fraud. These last are singularly few, if we consider the doubtful material which was

[1] General Orders, Badajoz, April 12th, 1812.

[2] Dickson Papers, 1812, page 622-3.

often slid into the commissioned ranks of the British Army, under a system of open and undiluted patronage, where the protegés of any politician or high official were accepted without much enquiry into antecedents. There are, in fact, only eight trials of combatant officers on such charges, some of which are pretty bad cases of deliberate fraud, and led to the cashiering of the culprit, though others seem to have resulted from gross carelessness and want of a nice sense of honour rather than from wilful determination to make money by swindling. I count two instances of the defrauding of merchants by giving worthless bills in exchange for goods or advances of money; four of embezzlement of company or regimental pay; one of selling for private profit horses belonging to the Service. The case over which Wellington gets most angry in his comments is that of an officer who, having received the pay of his company, went into Lisbon without leave and apparently lost it at gambling.

The Commissaries, as is natural, appear more frequently than the combatant officers in this sort of trouble. A good many of them are dismissed the Service for dishonesty, generally taking one of two shapes, either that of selling public stores to their own profit, or more frequently that of making corrupt agreements with native contractors or magistrates, by which they entered as received or consumed more food-stuffs, forage, or material than they had really received from the partner in their fraud. The money balance, for stores entered to and paid by the commissariat, but never really supplied, was, of course, divided between the commissary and the contractor. Such frauds always have existed, and always will, the opportunity for embezzlement being too strong for a weak man entrusted with money or money's worth, and working quite away from the close supervision of his superiors, in some remote corner where the public morality of the local magnates is a non-existent thing.

The medical branch of the army comes out of the enquiry into the relative frequency of courts martial much better than the commissariat. There are but a few trials of its members, and of these many are petty cases of insubordination to superiors, or breach of rules, which hardly seem to have merited the serious attention given them. Drunkenness was the most serious failing, and this sometimes led to brawling and other discreditable incidents in public. The most striking case is that of a young assistant surgeon, or "Hospital Mate," as they were then called, who not only disobeyed the orders of his superior, forgot nine men left by the way between Abrantes and Lisbon, whom he abandoned without remembering their existence, and left other sick unassisted for days on end, but made matters lively in his hospital by running through its wards with a bare sword, with which he drove to bed convalescents who had left their couches without his permission.[1] His methods can

[1] Court Martial on Doctor George Welsh, December 19th, 1809.

hardly have been conducive to the rapid recovery of his patients, and he was naturally dismissed the Service.

The punishments awarded to officers ranged down from dismissal from the Service with ignominy "cashiered and adjudged incapable of serving His Majesty in any capacity," to simple reprimand. The cashierings, of which there are something over 30, are for the rare offence of shirking action, for the little less rare crime of fraud, for aggravated cases of drunkenness or insubordination, for tyranny and arbitrary use of authority, and in one single case for gross and public immorality.

After cashiering, the next most serious punishment was Suspension from Pay for a shorter or longer term of months—six was far the most common figure. This was the usual award for serious breaches of regimental duty, brawling with the Portuguese or Spanish local authorities (which was very frequent) drunkenness when not on duty, various cases of insubordination to superiors, or breach of the General Orders of the Commander of the Forces.

Next came Reprimand, which varied much in shape and heaviness. It might amount to no more than the publication of the fact that the officer *was* reprimanded in General Orders, without further publicity. Or there might be added to the sentence the direction that the reprimand should be read to the officer condemned on parade before his regiment, or even the whole brigade in which he was serving. This, of course, was particularly humiliating to those who held senior rank, colonels and majors, who were thus held up to the derision of their juniors. But it was worst of all for the culprit when Wellington himself, as was his not infrequent practice, added some clauses of his own to the reprimand which was to be read before the regiment, *e.g.*, the words which I have already quoted, to the effect that "the time of courts martial is occupied very little to the advantage of the public service, in considering the unbecoming and ungentlemanlike behaviour of officers to each other." Here, however, is a specimen of a still more stinging allocution.

"This person may think himself very fortunate that the sentence of the Court has been so lenient. A different view of the evidence on the charge would have rendered his dismissal from the Service necessary under the Articles of War. The Commander of the Forces hopes that he will take warning by what has occurred, and will conduct himself on all occasions as a gentleman should. This reprimand is to be read to him by the Commanding Officer at the station where he may happen to be, in presence of the officers and troops paraded for that purpose."[1]

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1 General Orders, Freneda, February 3rd, 1813.

This was a case where the accused had challenged a senior surgeon to a duel, and had told him on parade that he "was damned contemptible, and should recollect that he was hereby publicly insulted"; which was, no doubt, as the charge recites, "to the prejudice of good order and military discipline."

The reprimand, in its various stages of stringency, resulted from convictions of the most varied order, ranging from the facetious offence of spreading false news of an absurd kind in order to scare a Portuguese Magistrate (which reminds us of some of Major Monsoon's doings in Lever's *Charles O'Malley*) to using a disrespectful name for a superior officer, striking a soldier who had been impudent, and misbehaving in the theatre at Lisbon.

This brings us to an end of the observations and deductions that may be made on courts martial upon officers and other persons holding commissions. We may now pass on to the trials of sergeants and the rank and file. Of these the details of about 500 (I think the exact number is 495) charges are preserved in the six volumes of "General Orders."

To commence with the greater military offences. There are two cases of privates who murdered their officers (one in the Buffs and one in the 42nd): in both cases the criminal was hanged, and not (as we might have expected) shot. I presume that the distinction was made that these were not instances of mutiny, but of private murder for personal spite. Certainly this was the fact in the Highland Regiment, where an ensign and a corporal had cast eyes on the same Portuguese girl, and the latter shot the former in an outburst of jealousy.

The tragedy in the Buffs was that of an officer who was shot, along with one of his sergeants, by a private, who, inflamed by drink and disturbed in mind by former misfortune, "ran amuck"—a phenomenon more common in native Indian than in British regiments.

Desertion to the enemy was the one offence which was regularly punished by the firing-party, and not the gallows. It accounts for nearly 200 of the 500 trials which I have analysed, and was the most common crime in the army save one—the plundering of peasantry, with which I shall be dealing later.

Desertion covers two offences of a different degree of heinousness—the deliberate going over to the enemy, which nearly always led to an execution when the criminal was caught; and the less heinous one of leaving the ranks and absconding into the countryside, either to avoid a punishment earned, or for purposes of plunder, or (as in one or two recorded cases) in the pursuit of a love affair. The deserter of the latter sort was more frequently flogged than shot, but in aggravated cases, or where he had repeated the offence more than once, he sometimes underwent the supreme penalty. During the latter years of the war there seems to have been a tendency to be more sparing

in the punishment of death, deserters being instead often given the sentence of life service in a colonial corps, generally in New South Wales, where they would have no opportunity of dropping into their failing again—since to desert at Botany Bay meant starvation in the wilderness, or at the best, a short career as a bush-ranger, ending in the inevitable gallows.

There seem to have been about 78 men shot for desertion during the six years of the war, of whom 52 appear from their names to have been British and 26 foreigners. The disproportion is of course enormous, as there were some 60 British battalions in the Peninsular Army, and only ten foreign battalions, so that the foreigners ought to have given only one deserter in six, instead of one in three. There is a similar disproportion in the list of deserters punished with flogging or with service in a colonial corps: here again the foreigners are numerous out of all proportion to their total strength in the army. The explanation is, of course, simple and obvious. The original foreign battalions in the army—the King's German Legion, the 97th or "Queen's Own Germans," and the Brunswick Oels Jägers—had been formed in the beginning with patriotic exiles, largely from the old Hanoverian Electoral Army, who had made their way to England in order to continue to serve against Napoleon: but this sort of recruit was no longer obtainable when the French domination was regularly imposed on North Germany, and the "Kingdom of Westphalia" had been formed, to include Hanover and Brunswick (which had supplied the British Army with so many good soldiers), as well as countless districts more. Recruits of the right sort for the German corps could not readily be got after 1807, and the only way in which any could be procured at all, was by trying to entice the numerous prisoners of German nationality, who fell into the hands of the British in Spain and elsewhere, to volunteer into the King's German Legion and the other corps which we maintained. This brought some willing and faithful men into the ranks, but also many who only enlisted in order to escape the irksome confinement of prison life, and were ready to desert back to the French if they got tired of the British Service. Only a moderate proportion of them were Hanoverians or other trustworthy men. But matters got still worse about 1811, when German recruits of any sort became increasingly hard to get, and the officials at home began to draft any sort of northern foreigners into the Legion and the Brunswick Jägers. They seem to have been largely Poles, Croats, and suchlike. Among deserters from the German corps in the latter part of the war, I note men with wholly non-Teutonic names, such as Gormowsky, Melofsky, Schilinsky, Wzztgok, Prochinsky, Panderan, Kowalzuch, Mateivich, etc. Clearly there was no reason why these Slavs should serve the British Government faithfully—fear was the only restraint that could keep them to their colours. Hence a long list of such deserters, and a savage roll of death penalties and floggings inflicted on them.

There was another regiment in Wellington's Army which had an even worse name for desertion than any of the German battalions. This was the *Chasseurs Britanniques,* a foreign corps, into which French and Italian volunteers from our prisons were drafted. If there was small reason why a Pole or a Croat should make a loyal soldier, there was no reason at all why a Frenchman or a Lombard should. The *Chasseurs* had the evil pre-eminence for desertion over every other corps in the army: the record of the whole war was the simultaneous absconding of a party of two corporals and fourteen privates of the *Chasseurs* in the autumn of 1812. Unluckily for themselves, they were recaptured before they could reach the French lines. All except one were, by their names, Italians. It is somewhat surprising to find that they were not shot, as they undoubtedly would have been in 1810, but only condemned to a very heavy sentence of flogging—800 lashes each to the corporals, 600 each to the men. I suppose that there was a sort of feeling in the minds of the members of the Court Martial that Italians absconding in this way could not deserve such severe punishment as British or Hanoverian deserters who might commit the same offence.

The native British, or Irish, soldiers who passed over to the enemy were generally the black sheep of their corps, who disappeared when they had made the regiment too hot for them. They seldom received any mercy, and were normally shot on recapture. On the other hand, I count up 25 men given nothing more than a flogging, and 26 sentenced to either a term of penal servitude or life service in a colonial corps for simple desertion, not to the enemy, which in many cases was no more than aggravated straggling, or absence without leave (worth about 500 lashes). Where a heavier sentence, such as 800 lashes, or penal servitude, was given, there was apparently intention to real permanent desertion proved, but no design to go over to the French. In some cases the men were apprehended many months after they had disappeared, living as peasants in Spanish or Portuguese villages, where they had settled down and married. Unfortunately someone recognized them when the battalion passed that way—and New South Wales became their doom.

After desertion, robbery is the most frequent charge against the rank and file. It may be divided into three categories. The first was plundering of the peasantry, either in times of short commons, when the men were mad to get food at any cost, or out of mere wanton desire for wine, meat, and small luxuries, when there was no such excuse of absolute starvation. The second was the far worse offence of robbery not of food, but of valuables—money and other negotiable plunder—taken not to satisfy bodily cravings, but for profit: this must always be the work of an abandoned ruffian, while food stealing might be committed by almost anyone in the hour of distress.

The last and worst class of robbery was that accompanied by violence and armed force, sometimes even by murder: there were bad cases of disguised men in bands breaking into farms and shooting down anyone who resisted, and of the practice of actual highway robbery round camps.

The two first categories of robbery were common in inverse proportion to their gravity. Mere food or wine stealing was rife in all hard times, and very frequently passed over with a blind eye by the regimental authorities. Still Wellington was always most anxious to suppress even simple and comparatively pardonable food-stealing. There are about 50 condemnations for it, of which the majority led to sentences of from 300 to 700 lashes, which seems excessively severe. The hardest case of all was that of the men of the 53rd, who got the heavy punishment of 500 strokes for stealing bee-hives and consuming the honey, during the retreat from Talavera, when the army was absolutely famishing for three days. There are a few instances where the still more weighty sentence of 1,000 lashes—sufficient to kill many men—was awarded for food or wine stealing, but in these punishments there was the grave addition that the plunders had resisted arrest by the provost marshal who had come upon them.

The other form of simple robbery without violence, that when money and valuables had been taken from peasants, supplies about 30 cases. The large majority of these criminals got the terrible sentence of 1,000 lashes, almost the greatest that could be awarded, only about five escaped with a 700 or 800 lash sentence. I presume that the difference between their punishment and that of the food and wine stealers was made on the rational ground that deliberate plunder for profit is far worse than mere hasty and casual food stealing, for which necessity could be pleaded, in many cases not without some justification.

But the special wrath of Wellington was launched against armed robbery accompanied by violence, as distinguished from mere stealing, and the courts martial did their best to carry out his view that this, in a friendly country, was an offence as worthy of death as desertion itself. It was always the work of the very worst men, and there could hardly be any extenuating circumstances pleaded. Of the 57 condemned on such charges no less than 24 were sentenced to be hanged, though two or three were pardoned on account of recent gallantry in action. Fifteen more were sentenced to the dreadful punishment of 1,000 or 1,200 lashes, three or four to long terms of penal servitude; the remaining dozen or so got off with heavy floggings of 600 or 800 lashes, the former being the least ever awarded. Of those condemned and hanged only a small proportion had been guilty of actual murder—it was the robbery by armed force, not the actual killing (which was rare), that Wellington judged worthy of death. Some of the men executed had taken comparatively little from the peasants whom they had plundered, and

had not severely injured them: no more than a blow with the butt-end of a musket had been given in many cases. But the moment that the element of violence was added to that of theft, Wellington became inexorable, and only pardoned on the rarest occasions.

To the list of offences against the peasantry, which we have thus recited, there must be added one more, though it did not amount to actual robbery. This was "embargoing," as it was called, *i.e.*, the pressing of carts, or oxen, or mules, without warrant. Even though they were returned within a short time, their seizure was reckoned a heavy delinquency. It was the special foible of small marching parties of convalescents or men returning from escort duty, and not under the charge of an officer, to seize on beasts of burden to carry their knapsacks, their baggage, and their footsore men, and then to discharge them at the next village and requisition another drove. Wellington was quite determined that this lawless system should come to an end, and when detected, sergeants were "broke," and privates got 300 or 500 lashes for venturing to infringe the general order on the subject. There are about a dozen cases of the kind, of which far the most amusing is that of a corporal and a private of the 88th, in January, 1812, whose whole details happen to have been preserved for us by an officer present at the court martial. He writes:—

"Early in 1812 pipes of wine for the troops had to be moved on country carts from San João de Pasqueira to the camps before Ciudad Rodrigo. The men on the escort would often contrive (in spite of the vigilance of the subaltern in charge of the convoy) to let a driver escape with his bullocks for a pecuniary consideration; they then illegally pressed other carts as substitutes. On one occasion, the commissary observed that two very fine white oxen, which were drawing one pressed cart, had been exchanged for two very inferior blacks. He complained, and the men in charge, a corporal and a private of the 88th, were brought to a court martial. On the trial everything was proved save the act of receiving money to allow the two big white bullocks to escape. The President, summing up the evidence, said to the accused, 'It is quite useless to deny the facts: you started with a pair of fine white oxen, and you bring back two lean black ones: what can you have to say to that?' Private Charles Reilly, nowise abashed at the poser, and ready with any excuse to save himself from punishment, immediately exclaimed: 'Och, plaise yer honour! and wasn't the white beasts lazy, and didn't we bate them till they turned black?' The court was not quite satisfied with the truth of this wonderful metamorphosis, and they were condemned to be punished, the corporal to get 700 lashes, Reilly 500.[1] But in consideration of the great gallantry displayed by the 88th at

[1] General Orders, January 22nd, 1812.

the storming of Ciudad Rodrigo a few days before, the culprits were in the end pardoned by Lord Wellington."

The next large section of courts martial with which we have to deal is those concerned with robbery, not from peasants in the countryside, but within the army—the purloining being either from officers or soldiers, or from the public stores. There seems to be about 40 cases. Some of them were bad ones, such as those of the sentry before the tent of Lord Aylmer, a brigadier, who took the opportunity of his employment to steal the general's silver camp equipage and cashbox, and three or four other men stole large quantities of money or valuable goods from officers, commissaries, paymasters, and others who were forced to have large sums of cash with them. Eight soldiers were hanged for large thefts of this kind. But the most astonishing feat was that of two licensed camp followers, named Barbier and Palacian, who burgled the commissary-general's chest in 1814, and stole from it no less a sum than £2,000. Being convicted, they naturally suffered the death penalty. Lesser, but still grave, offences of the same kind, led to ten sentences of penal servitude, and about as many more of severe flogging. Stealing from convoys was less heavily punished as a rule, the sentence being more often 500 lashes than anything else; to steal shoes or food when the escort was ill-provided with either was a different thing from stealing money or valuables for mere greed and profit. But there is one case of a corporal in charge of stores who was executed for plundering from them; his offence as the responsible person in charge being, of course, much greater than that of a mere private forming one of the escort. It would seem, too, that in this case it was not food that was stolen, but public property of some negotiable value. But the details are wanting.[1]

We have now reached nearly the end of the main categories of offences for which soldiers came before a General Court Martial, because they were charged with crimes too heavy to be dealt with within the battalion by regimental court martial. Grave cases of insubordination are the chief class that remains to be dealt with, *e.g.*, trials for striking an officer or a sergeant, or resisting arrest by the use of a weapon, or insolence of a public and mutinous kind. These led in one or two cases to a death sentence, when the accused had actually committed a murderous assault, but generally led to no more than a severe flogging—800 or 1,000 lashes where blows had been struck, 500 where the tongue only had been the offender.

The four or five cases of deliberate murder by one soldier of another, with *malice prepense* proved, led to hanging. But killing in chance medley in a bout of fisticuffs was punished with six months' imprisonment without corporal punishment.[2]

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1 General Orders, January 27th, 1810.

2 General Orders, January 5th, 1812.

There is one case of a jealous husband who stabbed an unfaithful wife in the moment of detection and slew her—he was given a year's imprisonment, rejoined his regiment and was killed in the battles of the Pyrenees.

Two cases of coining and passing false money only appear; a small number, when we remember that professional coiners existed in the army in such numbers that Wellington, in 1814, being at his wit's end for French money, since the Gascon peasantry would not accept dollars or guineas, actually set up a mint by the aid of coiners at St. Jean de Luz. He offered indemnity to any men who would volunteer to join in the manufacture of five-franc pieces, to be made by melting down Spanish dollars, and got together, it is said, as many as forty, with whose aid a considerable amount of imitation French money was struck. But there was no fraud on the peasantry, as the weight and purity of the pieces was carefully adhered to. This odd story is not only mentioned in Napier, but by Wellington himself, as reported in his *Conversations with Lord Stanhope*.

The remaining categories, only accounting for a score of trials between them, I will not trouble you with. The details of some were uninteresting, cases of fraud, of others unedifying—; wherefore I leave them unrehearsed. But the classes which I have dealt with in full include nineteen-twentieths of the whole, and will suffice to give you a general idea of what crime and punishment were like in Wellington's army.

DISCUSSION.

The Chairman (T. Milvain, Esq., K.C., Judge-Advocate-General): Gentlemen, I am sure you will all agree that we have heard a very interesting lecture on the administration of military law during the Peninsular campaign. The lecture has been exceptionally interesting to me, as I have been curious to know where Professor Oman got his information. I thought that I was the sole custodian of all court martial proceedings for a very long time past, and I think—though I cannot be certain of it—that they are still in my office. However, he has told us he got it from Wellington's General Orders, and his summary of the court martial proceedings and of the sentences is very interesting indeed. I noticed during his lecture that the greater number of general courts martial to which he referred, and to which he gave dates were before 1812, that is, before the time when the Civil Judge-Advocate-Generals went out to assist Wellington. I think I am right in saying that after Wellington had had the assistance of the Civil Judge-Advocate-General he very soon became his personal and intimate friend. You do not want to hear a speech from me upon the administration of military law, and I do not intend to give it to you. I do not propose to tell you anything about the administration of military law as administered by me and by my office at the present time, but I do not think I shall be guilty of any breach of confidence in telling you that in the event of war the General Officer in command abroad will be accompanied by a Civil Judge-Advocate-

General, and that he will have his assistance and guidance in all matters of International Law, and in all matters of the administration of military law.

Severity of Sentences.

With regard to the question of the sentences inflicted by the courts martial during the Peninsular War, no doubt they were brutal, but you must measure them by the civilization of that time, the moral standard of that time. Such sentences are not passed to-day. There is no flogging allowed in the army. I assume that these sentences were all legal sentences at that time. The Judge-Advocate-General has no legal control over a legal sentence, and although some sentences now administered by courts martial are severe, it is not the duty of the Judge-Advocate-General to reverse or mitigate the sentences, though he may, and sometimes does, exercise what is termed a moral influence. However, the sentences now are not, as a rule, too severe. I think you will be pleased to know, too, that in comparing—if I may be allowed to compare— the present with the past, the *morale* of the army is very highly superior now to what it was even a few years ago. Of course, I know that there is a great reduction in the rank and file of the army, but when I was first appointed to be Judge-Advocate-General the number of cases of court martial proceedings that were reviewed in my first and second years of office were in excess of 10,000 in each year; and I am glad to tell you that on the last return they exceeded, no doubt, 6,000, but they did not attain to the proportions of 7,000. That shows, I hope, that the tone of the army, the *morale* of the army, has very much improved.

As I said before, I am not going to discuss the question of the administration of military law; but I am sure you will agree with me that we have had a very interesting lecture from Professor Oman, and that the thanks of the assembly are due to him for having delivered it. I beg, therefore, to move a vote of thanks to Professor Oman.

THE VON LÖBELL REPORTS ON MILITARY MATTERS IN 1911.

(38th YEAR OF PUBLICATION.)

Précis from the German by LIEUT.-COLONEL E. GUNTER, *p.s.c.*, (*late*) *East Lancashire Regiment.*

(*Continued from November* JOURNAL, *page* 1568).

ARTILLERY TACTICS IN 1911.

Great zeal was shown in striving to build up on foundations of true tactical principles, and as a result to issue a number of new Training Regulations. But, as regards the artillery, it was here and there thought wiser to withhold new rules for the conduct of artillery action, as frequent changes in these not only render such conduct difficult, but are actually detrimental. If Regulations are to become the flesh and blood of the troops they must not be changed from year to year. When the organization of an artillery is once settled, and its armament with guns, ammunition and accessories provided for, it is well to gather and consider well the experiences these have afforded before issuing new Regulations. For instance, Russia hesitates about issuing new Regulations, and Germany has not yet undertaken a new reprint of its "Field Artillery Training."[1]

One question all are agreed on, that is the complete and continuous co-operation of the infantry and artillery in battle, though there are many conflicting views as to how this is to be ensured. Many essays and some books appeared last year voicing them. In France military literature busied itself especially with this. Yet a new "Field Artillery Training" has been taken into use. As to the co-operation of heavy and field artillery there is more general agreement. With a good mutual understanding the heavy artillery may be brought up under certain circumstances so as to cover with their projectiles the deployment of the field artillery, whereas formerly the idea was that it would be impossible for the heavy artillery to come into action until this was prepared for and covered by the fire

[1] This is not quite clear, as further on the Report on German artillery progress states that a new edition of the *Schiessvorschrift* with the *Schiesslehre*, rewritten, was issued in March, 1911, and the various changes are noted at great length. Of course there is no space even to epitomize these here (they are entirely technical); again, it says that the second part of the (provisional) *Feld Art Exerzier-Reglement*, for the service of guns, ammunition, and the use of observation wagons, etc., was issued in May, 1911.—E.G.

of concentrated field guns. Everyone is agreed as to the necessity for the intimate co-operation of infantry and artillery, but many differ as to how this is to be brought about. In the course of the year under review many books and essays were published on this subject. The difficulty of observation when the battery is firing from a concealed position, except in cases where there are natural elevations close by, which afford good observation positions, has led to the introduction of observation wagons fitted up with steps or ladders. Yet these may easily betray the position of the guns. Observation from aeroplanes becomes more important, and practical experiments must determine the value of this. As more ammunition will now be required than heretofore, means to supply this must be studied; the use of mountain artillery even for employment in flat country, the introduction of improved range-finders, greater effect against shielded guns, and considerations of concealed positions for guns, also how to get good fire effect from these, are questions which have all been more or less discussed in the Reports of the past year.

FIELD ARTILLERY IN INDIVIDUAL STATES.

Austria-Hungary.—There is little to report since 1909. New Field and Mountain Artillery Training Manuals were issued, and the organization seems to work satisfactorily, especial praise being earned in the manœuvres for their good fire, conduct, and direction, and for their co-operation.

Belgium.—New "Field Artillery Training" has been issued in two volumes to the Army, but is not obtainable by purchase from booksellers. It is discussed in Nos. 22 and 43 of the *Militär Wochenblatt*, 1911. These numbers discuss in detail of a very technical nature the different kinds of fire used. These are said to present nothing novel, and can of course not be reproduced here. A special method of fire against cavalry attack is laid down where it is attacking their own cavalry. The chief points on which stress is laid are: Coming into action by surprise; unity of massed fire effect; co-operation with other arms; organization of the artillery under one command for battle or for any other united purpose. Fire positions may be either in the open or under cover. In the new Belgian Field Service Regulations the battle and ammunition supply are treated in Part IV., and in the provisional "Infantry Training," artillery action is dealt with at the end of the section "Infantry in Battle."

France.—According to the latest information available, the following number of rounds are in future to be provided for each field gun:—With the battery, 312 (including 36 high explosives); in the Corps Ammunition Park, 267; so a total of 589 rounds against 502 hitherto carried.

As regards heavy artillery, the *Vade-Mecum*[1] says, that in each army there are to be three brigades of three batteries each, and a staff; the battery has four heavy-155mm. (6.1-in.) guns, 8-horsed. Each batt. has ten ammunition wagons, two light ammunition carts for service during firing, one field forge, one forage, and three supply wagons. Each batt. ammunition column consists of two ammunition sections of 30 ammunition wagons each, and the necessary supply wagons in proportion.

The employment of heavy artillery depends much on the nature of the country. In well-known country, for instance, when advancing towards a fortified position it can be assigned a forward place in the column of march. In other cases it is to be kept further back until the situation is cleared up, so that it may at once proceed to positions where its effect is most required. This effect is both material and moral if employed against decisive points, where its great effect can most suitably be developed. In defence its best position is in second line, with observation stations in the first. Its curved fire effect can best be utilized to reach objects in dead ground, which field artillery could not destroy. It should not therefore be used against troops in the open, where an increase of field artillery effect would suffice.

Germany.—The new *Schiesslehre* was re-written in March, 1911, and issued to the artillery provisionally. The main points are: careful preparation by the battery commander, to ensure rapid opening of fire, and quiet continuance of steady quick-firing. The observation ladders now carried much facilitate this. The Report deals with the many instructions in the *Exerzier-Reglement* to the extent of 4½ pages of closely printed matter, in which there is a certain amount of repetition. This is more suitable for a purely artillery journal which deals with such technical details. As mentioned in the general remarks at the head of this section, the question of the earlier employment of the heavy artillery and its forward place in the column of march is discussed. If two divisions of an Army Corps are following one another on one road, the heavy artillery is, as a rule, to be attached to the leading division, and march next to the last of its infantry in column. If its early employment is anticipated it may precede the main body of the field artillery; this, the Report remarks, may lead to great delay in bringing the latter into action, and especially in the infantry deployment. In the Regulations for the foot artillery the principles of the command and conduct of the artillery in an Army Corps and in the division are laid down. In the latter the Divisional Commander is responsible for the co-operation of both infantry and artillery in united action.

[1] *Vade-Mecum*, de l'Officier d'Etat Major C. Lavauzelle, Paris, 1911. 10ème édition.—E.G.

Great Britain.—The instructions issued by the general staff for the command of artillery brigades are noticed, *viz.*, that with Q.F. guns Brigade Commanders must leave to the Battery Commander all details as to how the orders given by him are to be carried out. The new field howitzers[1] are said to have given universal satisfaction. There is a great demand in English military literature for mountain guns to be used in ordinary country as well as in mountain warfare. The experiences of the Italians in Tripoli are quoted in support of this. It is considered that in close country, where horsed batteries cannot get near enough to the fighting line to support the action of the infantry and co-operate with them, pack artillery would be handy and effective. Many English artillery books and essays are referred to, such as Col. Bethell's *Modern Artillery in the Field, The Journal of the R.A.I., Pack Artillery, Horse and Field Artillery Training, A Study of German Artillery Tactics,* etc.

FIELD ENGINEERING IN 1911.

There is really nothing new to bring to notice in this part of the Report since that of 1909.[2] Following on the experiences of the Russo-Japanese war there is a demand in Germany for the increase of the field companies (*Pioniere*) with the German division, which only has one. The Japanese had three and found these insufficient. At the same time there is a strong feeling that field entrenchments ought to be executed by the troops that have to defend them. Even if the engineers have to be broken up into sections to be attached to battalions as instructors in entrenching, it is injurious to the engineers as a corps, etc. Among engineers there is a cry that the infantry should learn to be more independent of them. In Austria it is demanded of the infantry that they should not only do the earthwork, but be able to make overhead cover themselves, as well as do all the simpler part of the road-making required in the vicinity of their camps, and carry out ordinary demolitions, etc.; that the cavalry must be able to do all the light bridging required, and the erection and repair of telegraph and telephone stations, now that they have with them an engineer detachment with a light bridging train attached. The same ideas prevail in Russia. Every year a number of officers, N.C.O.'s and selected men are to go through instruction courses in the engineer camps, and, after passing practical examinations, to return to their Corps as *Troop sappers* to instruct others. Each company has to put in two "practices" at inspections, and

[1] The 4.63 howitzer is meant. Details of this and a photograph of this are given in the Report under "Artillery Material" (p. 398 of Text, and Plate 3).—E.G.

[2] See the JOURNAL, January, 1911, p. 71.—E.G.

three in open country, Generals and inspecting officers are to certify that they are efficient in their annual Reports.

As regards field works: It is more than ever necessary that these should only be constructed in accordance with the tactical requirements of each case. It is imperative that our commanding engineers should therefore be well acquainted with the ideas and intentions of the Commander of the Force. The defence of localities, valuable as concealing the defenders, is now, it is said, rendered doubtful by the increased power of modern artillery. But the extraordinary use made of these localities by both Russians and Japanese in Manchuria leads one to look upon artillery fire effect as somewhat overrated. Considering the great extent of cover troops now occupy in a modern battle it may be doubted whether the loss inflicted on them can be commensurate with the immense amount of ammunition expended. General Langlois thought that artillery could effect little against such extended defensive positions, and that all the shells carried by an Army Corps would not suffice to destroy a large village. It is different of course when artillery fire is directed against an isolated house or farmstead. Unless the actual effect of artillery fire can be observed, it is comparatively useless. These ideas, if generally accepted, will modify the plans hitherto usually adopted heretofore for the distribution of the defenders in large villages, etc. More stress will be laid on the careful selection of good, well placed walls, and on the inclusion of certain suitable buildings.

The attack of entrenched positions is becoming more like that of a fortress. The various ways and means are well indicated in the *Mitteilungen über Pionierwesen*, 1911, Vols. 1 to 4. The Russians still use redoubts, which do not find much favour in France and Germany.

MILITARY BRIDGING.

Captain Normand gives us a fairly detailed account of the bridging train of a French Army Corps. The engineers, as with the two divisions of the Corps, carry no bridges, but only floating inflatable bags, with which they can construct rafts to push patrols across or send them over singly. The Corps Engineer Companies, composed of two-thirds *pontonniers* and one-third miners at present, will probably in future consist of *pontonniers* only. The cavalry divisions have no light bridging train yet. Captain Normand describes the whole arrangement as a happy-go-lucky business. The Austro-Hungarian cavalry is much better provided, four 4-horsed wagons carry the bridging apparatus. In the Herbert System (1908) aluminium portable boats in two parts have replaced the former steel boats. The superstructure is formed of strengthened chassis 3.99m. (13 ft. 1 in.) long, .7m. (2 ft. 2 ins.) wide, and of these ramps, roadway, etc., are formed as required. Road bearers are also

carried, which can be used as trestles. Interesting details of length, breadth, etc., are given, and of the troops carried across, which we regret we have not space for.

Various details of bridging expedients are given in the Report, especially of a Norwegian appliance for rapidly crossing ditches, etc., in face of the enemy. Much attention has been paid to pile bridges and pile driving by the aid of auxiliary bridges alongside.

PERMANENT FORTIFICATION IN 1911.

The Report says that the Italo-Turkish war in Tripoli furnished little useful experience, and that we are for this thrown back on the great siege of Port Arthur by the Japanese in 1904, regarding which two studies are especially brought to notice,[1] and many other works are mentioned, which we have not space to enumerate. The new German text-book, *Anleitung für den Kampf um Festungen* (1910), has, the Report says, been received everywhere with the greatest interest. Major Tœffer's lectures[2] are spoken of and many articles on coast defence, etc., such as *Die Landesverteidigung Hollands Internat-Revue*, 1911, (*Beiheft* 120), *Die Küstenverteidigung des Britischen Weltreiches* (*Stavenhagen*), (*Jahrbücher*, October, 1911), are cited. A long chapter on "Fortress Warfare" is given, which is of especial interest, sketching, as it does, under different heads, German and foreign views on, (*a*) methods of attack; (*b*) the inhabitants and the question of constructing an *enceinte*; (*c*) the artillery of the attack and defence, in which the question of advanced positions comes in; (*d*) the close attack, in which the employment of machine-guns is discussed; (*e*) the Russian methods of attack; (*f*) the practice of fortress warfare in peace. This is followed by a chapter on ideas as to construction of fortresses, subdivided into (*a*) hill fortresses; (*b*) coast defence. Lastly comes a short chapter of the development of fortification in Europe in 1911, of which an epitome is given.

Austria-Hungary. — Besides strengthening certain fortresses, improvements were made in the communications by rail and road. The country between the valley of the Adige[3]

[1] The distant and close attack of fortresses (*Fern u. Nahkampf*), *Mil. Wochbt.*, 95, 96, 97, of 1911.

Artilleristische Wahrnehmungen. Art. Monatsheft, 8, 9, 10, of 1910.

Takowleff *Défense des ouvrages permanents* and *Internationale Revue*, 1911, Suppl. 140.—E.G.

[2] *Wiederholungsbuch der Festungslehre u. Kampfes um Festungen 2te Auflage*, Berlin, *Eisenschmid*, 1911.—E.G.

[3] The Adige rises south of the Reschen-Scheideck Pass, flows past Glurns-Meran in Austrian Tyrol, by Botzen, Trient, Verona, Legnago, into the Gulf of Venice. It is in Italy broad, deep, unfordable, and of great military importance.—E.G.

and the Western Spurs has been connected up by a railway leading from Botzen over the Mendel Pass to Mezzo Lombardo, where it again joins the line Botzen—Trient. This much assists the defence of S.W. Tirol. The railway from Partenkirchen by Mittenwald and Scharnitz Pass to Innsbrück has been so advanced that it may be worked (it is said) in the course of 1912.

Belgium.—As regards the Scheldt defences the Report says:—In consequence of the strain between Germany, France and England, in the course of 1911, the Belgians were inclined to open their gates to the two latter Powers, free access to Antwerp being of importance to them. This seemed to be imperilled by the intention of the Dutch Government to erect new fortifications at Flushing on the lower Scheldt. Some sought to represent this as an injury to the neutrality of Belgium, and invoked the aid of the Great Powers, which guarantee this, to stop it. The facts that Flushing was formerly fortified, and that fortifications still exist on the lower Scheldt, were silently ignored. The acknowledged right of the Dutch to fortify the mouth of the Scheldt in order to preserve their own neutrality is therefore the only matter in dispute. The Belgians, however, demanded plainly that the Scheldt should remain open in case they were threatened and a friendly Power wished to come to their aid. As they felt themselves (without any reason, in the opinion of the German writer of the article), threatened by Germany, it was apparent in whose interests they wished to hinder the barricading of the river.

Germany.—The fortresses Breslau, Kulm, Marienburg, are now included in the official list. In the other places formerly fortified the ramparts are being levelled. At Cologne the old lines of the left bank are being levelled, and the old forts Paul v. Mecklenburg, Prince Nicholas, Prince Frederick of Holland, and forts Prince William and Henry of Prussia are being left open, as is the north-west front of Königsberg.

Great Britain.—The Admiralty has decided to connect by a canal the inner basin of the naval harbour Rosyth with the neighbouring Bay of Inverkeithing, to prevent the enclosure of the fleet, as the great Forth Bridge could be easily disabled by an enemy and the chief outlet from Rosyth be thereby imperilled. This canal would be of strategic importance. The Inverkeithing Bay could also be utilized as a central station for torpedo boats and destroyers for the relief of Rosyth, and as an advantageous flank position in defence of the outer waterway of the new naval base. These works are to be completed by 1913.

Italy.—The following harbours are of military (naval) importance: Ancora, Brindisi, Gaëtà, Genoa, Messina, Naples, Palermo, Spezzia, and Taranto. The disuse of Taranto as a

war harbour is sharply criticized by the naval war correspondent de St. Pierre, who gives in detail his reasons and his opinion as to what work ought necessarily to be undertaken to fulfil the requirements of a fleet there. On the Lake of Garda the island of Trimelone has been fortified, and commands the roads to Peschiera and Desenzano.

Russia.—On the northern shore of the island of Sveaborg (south of Helsingfors) additional works are being constructed. What their armament is we do not know. Two other points in the Gulf of Finland are also to be fortified to bar the approach to Kronstadt and St. Petersburg.

Sweden.—About a million gold kronen[1] are being allocated yearly to a Sinking Fund to provide for the fortification of certain coast defences, and the Defence Committee has recommended the completion of the works at Basholm and Oscar-Fredricksborg, as it considers the safety of Stockholm is exposed to attack by sea owing to the development of modern naval artillery.

Turkey.—The Report mentions the appointment by the Government of a special commission, which was to take into consideration in 1911 such projects as the strengthening of the works on the Bosphorus and Dardanelles, the construction of naval harbours at Smyrna and Salonika, as well as the fortifying of other important points on the Turkish Mediterranean coast. To save money it was decided in 1911 to dismantle several old fortresses, which are enumerated. At Salonika new works were to be erected, as Cape Burun and the old fort Kasaburun are dismantled. Monastir and Mitrovica were to be fortified, but Preveza, at the entrance to the Gulf of Arta, was to be left open. The unexpected invasion of Tripoli by Italy, however, prevented these plans from being carried out.

SMALL ARMS IN 1911.

General.

The question of the automatic and repeater rifle is still hovering in the foreground of general interest. No one has as yet followed the example of Mexico, but besides France and England other States have approached this question. There are few great Powers that have not a repeater of one pattern or another in hand. The suitability of such a weapon for war must, however, first be demonstrated. In some cases there is talk of these rifles having been issued for trial by certain troops. It remains to be seen whether this in fact, is because a re-

[1] About £5,500.

armament has been decided on, or whether such trials have for their object to see how a particular pattern that has already met with favour would suit the troops. Latterly the so-called "armoured ammunition" is being discussed. This is a special pointed ammunition, of which the bullet is either all-hardened or has its kernel formed of a particular hardened steel. The effect of pointed ammunition against the present artillery shields is already greater than that of rounded (ogival) bullets. With the above-mentioned armoured ammunition the penetration would be considerably increased. The *Journal des Sciences Militaires*, No. 81, of 1911, has an essay on "Automatic Rifles," in which it divides these into three classes or groups, according to the way in which the repetition of the firing is produced by the action of the gases, the recoil, etc.; others divide the known self-loading systems into four groups, (1) those in which the barrel recoils; (2) those in which it glides forward; (3) those in which the barrel is immovable; (4) those in which the fixed barrel has a parallel tube alongside.

The Report appends a table of the magazine rifles in use by the armies of the world. This was epitomized in THE JOURNAL for February, 1911, page 190. Exigencies of space then prevented the inclusion of the following:—

Nation.	Designation or System.	Year.	Calibre.		Rounds on mag.	Weight of Bullet.	Weight of Rifle and Bayonet.		Distance sighted for.	Muzzle Velocity
			mm.	in.		grs.	lb.	oz.	yds.	f.s.
Bulgaria	Mannlicher	1890	8·8	·315	5	162S	10	11	1,145	2,171
Greece	Mannlicher / Schönauer	1890	6·5	·256	5	160R	10	5	2,180	2,338
Roumania ...	Mannlicher	1890	6·5	·256	5	159R	9	12	2,180	2,527
Servia	Mauser	1890	7·0	·275	5	170R	9	8	2,180	2,296
Turkey	Mauser	1890	7·65	·303	5	155S	9	3	2,180	2,778

S = Spitz or sharp pointed bullet. R = Round or ogival bullet.

Austria-Hungary.—Successful experiments are said to have been made with a bullet filled with a smoke giving powder. On the bullet striking the ground a percussion cap is ignited, which causes a visible little smoke cloud to be emitted from the bullet. Two or three volleys with these will give quicker and better indication of the range and direction than any range-finders, it is thought. Experiments are also being made with an automatic rifle on the "Bang" system. The loading mechanism is combined with a "silencer" (Maxim). This moves forward a few centimetres on firing, and this movement connects it with a lever under the barrel, which is acted on by the gas pressure. This throws out the empty cartridge, brings up the new cartridge into the chamber, and closes the breech,

which latter action works by a spring on the "silencer" and draws it back into its place. This system is considered advantageous in that no gouging of the barrel is necessary, and thus the fouling of the grooves and the hindrance to smooth and rapid loading is avoided. *Per contra* it gives increased weight. The problem of fixing a bayonet or sword bayonet on to this rifle is, moreover, not yet solved, whether the above combination, which introduces additional springs, etc., into a rifle, which has already enough small parts in its mechanism, is doubtful.

Belgium.—The experiments at the Beverloo camp with pointed bullets have been continued. It seems probable one of 12 grammes (185 grains) will be adopted.

Bulgaria.—The 9mm. (3.06-in.) Parabellum pistol has been approved of by the authorities as the weapon for the equipment of all officers carrying pistols.

Italy.—The *Genovori-Revelli* automatic rifle has been improved, and 6,000 of these are to be issued for trial to 12 Bersaglieri Cyclist Battalions. The details of this rifle are, of course, kept secret. It is said to be of the same weight as that now carried, and to have a fixed barrel. It is called the *Terni* automatic rifle, as the *Terni* Small Arms Factory makes it.

The *Glisenti* automatic pistol is to be introduced for officers.

Switzerland.—The Technical Committee has not yet recommended the adoption of any pattern of automatic rifle, though experiments have been carried on with many, none of which, however, justified the opinion that they could advantageously replace the present rifle. Moreover, they are of opinion that no existing automatic system satisfies the requirements of a military rifle. The Swiss *Monatschrift* does not concur in this, but continues in its belief that the birthday of an automatic rifle fulfilling the exigencies of war is approaching.

United States.—A "silencer" on the Moore system has been tried against that of Maxim, over which it claims the following advantages: (1) it is 2½ ins. long against the 5½ ins. of Maxim; (2) its attachment is lighter yet firm; (3) it can be utilized with the bayonet or sword fixed, which the Maxim cannot. Neither were, however, found quite satisfactory, so both of these manufacturers are busy with improvements, and further experiments will be carried on.

Machine-Guns.—The Report gives a table of these guns and their carriages, calibre, etc., but says there is nothing new to report. It says that there is a tendency to increase the thickness of their shields beyond those in use for artillery, notwithstanding the additional weight,[1] the defects of their small

[1] The table does not give the thickness of the shields in use.—E.G.

cone of dispersion as compared to that of the fire of rifles is known, so that if the distance judged is incorrect the fire effect is small, and much ammunition is wasted. A French invention is said to remedy this.

The effect of machine-gun fire would be increased if each machine-gun were furnished with a telescopic attachment. The Report describes in detail such an apparatus, which we have no room to epitomize here. The Italian Captain Revelli is said to have designed a new pattern of machine-gun.

Bulgaria.—All machine-guns were fitted with shields by 1911. They use the Maxim 8mm. (3.15-in.) calibre.[2]

France.—The new automatic bullet-dispersing attachment for machine-guns, invented by Major d'Auriac, was tried at the camp of Chalons in 1911. It answered up to 1,600 metres. It acts without diminishing the rate of fire. A cone 200 metres wide and deep was formed, and fired from 1,500 to 2,000 bullets in about three minutes. *Automobile-Mitrailleuses* machine-guns mounted on motor lorries, to fire at a high elevation against aircraft, were also tried, but could not generally be halted and aimed rapidly enough to produce good effect.

Italy.—An ingenious Captain of Bersaglieri has invented an apparatus to be attached to a machine-gun which imitates its tat-tat exactly, so that if intelligently used in action at times much ammunition may be spared.

The new *Revelli* machine-gun has been tried by the Experiments Committee and given especial satisfaction. Its chief feature is its lightness (12 kgs., or 28 lbs., against 15 kgs. of the older patterns), without injury to its ballistic properties. It is also said to be extremely simple. It can be used automatically for single gun or rapid continuous fire. There are three different methods of cooling the barrel: by air, water, or by changing the barrel. The rate of fire is about 600 shots in a minute.

ARTILLERY MATERIAL IN 1911.

There is scarcely anything of importance to report as to changes in artillery material last year.

Many States are paying particular attention to mountain guns. These are mainly of two classes: (1) those with movable elevating barrels, etc., and alterable recoil; (2) those firing at a fixed elevation with unalterable recoil. The Krupp 4.3 shielded howitzer is an example of the latter type (a photograph of it is given with details, for which we have not space here). All gun factories are striving to perfect their field howitzers, the importance of which in modern war is recognized. A long

[2] The Servians use a Maxim of 7mm. (.276-in.) calibre; the Greeks one of 6.5mm.; and the Turks one of 7.65 (.301-in.) calibre.

chapter gives details of these by Krupp and Erhardt (*Rheinische Metallwaren Fabrik*), and of aircraft destroyers, etc. Details of new guns for this purpose, 8¾-pounders by Krupp, and 14½-pounders by Erhardt, are given, with ranges of 11,000 and 9,140 metres, respectively. Photographs and details of the British (4.63-in.) field howitzer, the Erhardt L/17 Norwegian mountain gun, and of the Schneider 28 c.m. (11-in.) portable siege mortar, are also given.

Austria-Hungary.—In the spring of 1911 trials were made in the presence of a Technical Committee of a *Skoda* 30.5 cm. (12-in.) siege mortar. It can be taken to pieces in three parts for its travelling carriage, and put together for firing from a mortar bed. It is reported that it gave satisfaction as to accuracy, weight, and simplicity of service. The new telephone apparatus, as provided for the infantry, was adopted. Experiments have been made with a new 12 cm. (4.7-in.) heavy artillery steel gun.

Belgium.—The 18 field batteries sanctioned in 1910 have been provided. The gun is a 7.5 cm. (15.5-in.) Krupp barrel-recoiling one.

The eight guns of 28 cm. (11-in.) calibre that were ordered for the fortress of Antwerp have been mounted; four of them on disappearing carriages.

Bulgaria.—The delivery of the 12 cm. (4.7-in.) Schneider field howitzers was commenced early in 1911. It is not known how far it has progressed.[1] The newspapers say that this howitzer has a pneumatic break and fires a heavy shell of 21 kilos. (46¼ lbs.) weight, muzzle velocity 984 f.s.

Great Britain.—Full details of the British 60-pounder (12.7 c.m.) siege gun are given, with the number of rounds carried for each gun, and in the battery; the muzzle velocity is given as 2,160 f.s., range 13,600 metres. It is noted that a small fort has been erected on Walney Island for the defence of Barrow-in-Furness and the Vickers Maxim dockyard, and that comments have been made in the press as to the deficiencies of many coast batteries, which have still only 9.2-in. guns wherewith to combat modern warships, for which much heavier guns are required.

France.—Experiments are still being carried on with a view to a thoroughly satisfactory heavy artillery gun. It must be lighter but of the same calibre and as effective as the field artillery gun. The War Minister says these conflicting re-

[1] It is remarkable that so little should be said in Germany, judging by this publication, of the great progress made by Bulgaria, Servia and Greece in military matters. Yet the possession by Bulgaria in 1911 of the Schneider-Canet Q.F. gun, and of heavy 4.7-in. and 5.9 Creusot guns must have been known, as well as of the six batteries of 12 cm. (4.7-in.) howitzers.—E.G.

quirements are difficult to fulfil. One newspaper says that by using the very latest pattern barrel recoiling system the weight of the gun carriage could be reduced to about 30 hundredweight. A new observation wagon, with ladder, has been tried and approved. In its limber are carried two *Satz* (electric piles) of telephone wire and apparatus. Each *Abteilung* (artillery brigade of three batteries) is supplied with five piles. All batteries are to have this observation wagon by the end of 1912. The telephone apparatus and length of wire (500 metres on the drum), tools, etc., carried by three riders are described. The introduction of light field howitzers and the reorganization and increase of the heavy artillery was urged by M. Clémentel in his Report for 1911. The details of the *Rimailho* howitzer are again given.

The light field howitzer recommended is one from 4-in. to 6-in. calibre, carrying a shell of about 15 kilos (33 lbs.) weight. The combining of fire effect and a good supply of ammunition with sufficient mobility is what is to be aimed at; and four batteries of such howitzers are to be added to each Army Corps; each battery of four howitzers is to work, in every engagement, in co-operation with the field artillery.

Italy.—From Tripoli the reports of the Italian field artillery are quite favourable,[1] especially as to its mobility. This army is supplied also with a 14.9 cm. (5.86-in.) Krupp field howitzer. This piece has a long recoil and is covered by a large shield. The barrel can be withdrawn from its cradle into a travelling position for the march. The *Temps* says these field howitzers have proved very mobile and handy at the manœuvres in 1911. At the Turin Exhibition in 1911 a 13½-pounder mountain gun and several others were shown.

Russia.—The heavy artillery comprises some mortar batteries, 12 cm. (4.7-in.) field howitzers, Schneider-Canet make, weight in action 1,324 kg. (26 cwt.), firing over 5½ ft., with a range of 7,500 metres, weight of shell 55½ lbs., muzzle velocity 1,100 f.s.

The 15 cm. heavy howitzer (5.9-in.) fires a 58 lb. shell at an elevation of 43 degrees. The gun is the chief weapon for coast defence to oppose hostile armoured vessels, but it is supplemented by the fire of howitzers, which are, however, of small calibre.

Turkey.—In 1911 88 barrel recoiling field guns, 2.95-in. calibre, were ordered from Krupp, and 18 mountain batteries of 2.95-in. calibre from Schneider (the mountain batteries have four guns each). They carry a shell weighing about 11½ lbs. They fire over a height of 2 ft. 4 in.

United States.—For coast defence most of the guns are of 5 ft. 9 in. calibre and upwards. For the defence of the

[1] This was the 7.5 cm. (2.65-in.) gun of 1906, carrying a 14½ lbs. shell, muzzle velocity = 1,675 f.s.—E.G.

Panama Canal guns of 14-in. calibre are to be mounted on the Pacific side, and, for the Atlantic side, guns of 15.9-in. and 14-in., and mortars of 11.9-in. calibre. Trials have been made with aircraft-destroying high-angle guns of small calibre.

OBITUARY.

Lieut.-General Rudolph von Caemmerer, of the Prussian Army, born at Coblenz on 25th June, 1845, and died at Schönberg on 18th September, 1911, entered as a *Fähnrich* the 29th Regiment of Infantry from the Cadet Corps in 1862. He served in the war of 1866, including the battles of Münchengrätz and Königgrätz (Sadowa). He joined the Staff College after the war and served in the Franco-German war as First-Lieutenant, being severely wounded at Wörth. In 1873 he was appointed Instructor at the War School in Cassel. Thence on promotion to Captain he was appointed to the General Staff, and attached to the XVth Army Corps (Strasburg). In 1878 he was transferred as a Company Commander to the 83rd Regiment. In 1880 he was promoted Major and again employed on the General Staff with the Vth Army Corps at Posen Headquarters. In 1886 he commanded a battalion of the 21st Regiment. In 1887 he became Lieut.-Colonel, and in 1890 Colonel and Regimental Commander of the 114th, and in 1893 Major-General and Brigade Commander. He was knighted in 1896, and in 1897 promoted Lieut.-General and Commander of the 26th (Royal Württemberg) Infantry Division. He retired in 1900. When he retired his industry as a military writer brought him to prominent notice. Among his works were: *Frederick the Great's Plans of Campaign for* 1757; *The War in* 1859—*Magenta; The South German Armies in* 1866; *Clausewitz—Development of Strategical Science in the 19th Century; The War of Liberation of* 1813-15: *A Strategic Review; The War of* 1866 *in Germany* (a new edition of Von Letton-Vorbeck's work). As a writer on tactics he was highly esteemed. He owed this to the late General Von Schlichting, to whose writings he especially bore tribute, and whose battles he skilfully fought against all who opposed his views. His latest work, written in collaboration with Baron v. Ardenne, on *Wehr und Waffen,* is not yet completed.

General Wilhelm von Scherff, of the Prussian Army, was born at Frankfurt in February, 1834, and died on 16th April, 1911, in Naumburg. He entered the Army from the War School in 1860, rose to be First-Lieutenant, and was on active service in 1866 with the Federal Troops, acting as General Staff Officer to General v. Beyer. He served on the staff in many capacities, and in the Franco-German war of 1870-71 he served as General Staff Officer of the 19th Infantry Division. He was severely wounded at Tours. In 1871 he was again appointed to the General Staff and Instructor of Tactics at the Staff College

in Berlin. He became Lieut.-Colonel, then Colonel-Commanding the 29th Regiment, in 1883, Major-General Commanding the 41st Brigade, and in 1888 Lieutenant-General and Commander of the 18th Division. He retired in February, 1891. His works on tactics are well known and very numerous. *Studies in New Infantry Tactics* was considered an epoch-making work[1] in the German Army; *Some Tactical Principles for the Leading of Troops; Tactical Theories and Practical Tactics; Delbrück and Bernhardi; Considerations of the Battles of Colombey, Vionville, Mars la Tour, Gravelotte, Noisseville, The Sedan Campaign, etc.; Tactical Principles and Boguslawski; United or Individual Methods of Attack, from the Experiences of the South African War; Attack in Battle in the Light of von Schlichting's Tactical Principles; A Comparative Retrospect of the Literature of the Day on Infantry Attacks,* etc. As a tactician von Scherff laid the greatest stress on the *unity* of infantry attack. He thereby came into collision with many other military writers, but also with the new Regulations of 1888. In spite of this, and though, owing to the peculiarity of his style, his works, which are full of thought, did not meet with the wide circulation that they deserved, his influence on the intellectual education of the German Army must be considered a high one.

The Report ends with its usual brief *résumé* of the campaigns of the year, which embrace those in Marocco and the Riff against the Moors, the Italo-Turkish war in Tripoli, etc., the Turkish war against the insurgents in Yemen, etc. Some short notes and sketches of these have already appeared in THE JOURNAL.

[1] This book was translated into English at the time, and to this and other works of eye-witnesses of the battles and combats of the Franco-German war may perhaps be attributed the revival of the study of tactics by British officers, though it was long in bearing fruit. General v. Scherff's later works took a more philosophic tone *e.g., Die Lehre vom Kriege.*—E.G.

DIAGRAM TO ILLUSTRATE THE ACTION OF TIDE-GENERATING FORCE, ESPECIALLY THE INTEGRATION OF THE TANGENTIAL COMPONENT. (MOON OVER THE EQUATOR.)

By J. RUTHVEN, ESQ., late Commodore of the Orient Line.

THE central figure represents the earth as seen from a distant point vertically over the South Pole, rotating on its axis in the direction of the arrow.

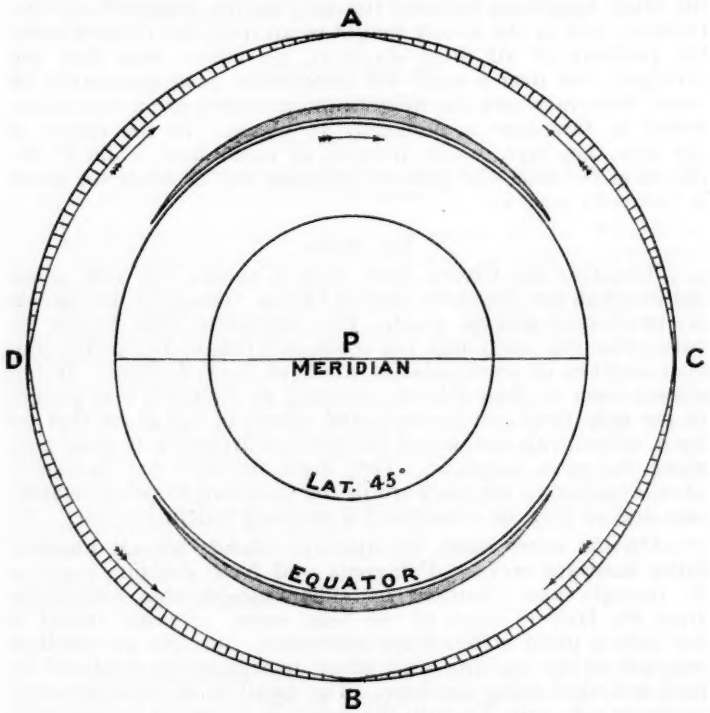
The outer ring is an attempt to show graphically the varying value of the tangential component and how it is integrated under the moon and at the point most remote from her. The tapering of the ring is meant to illustrate the gradual increase and decrease in the tangential pressure not only in the surface water under it, but also in every layer thence to the bottom of the ocean. At A the spot under the moon and at B, C and D the tangential component is zero, the whole tide-generating force at these points acting normally—outwards at A and B, and inwards at C and D. In the centre of each quadrant tangential force is a maximum.

The difference between the moon's attraction upon any particular particle and her average attraction is so small (its maximum value is only one eight and three-quarter millionth part of terrestrial gravity) that by itself it could produce no appreciable alteration in the level of the water, but if we imagine this symbolic ring divided into a series of graduated weights, with the pressure accumulated, or integrated in both directions from C and D towards A and B, in exactly the same way as in a vertical pile of weights standing on the ground where the pressure increases as it approaches the bottom of the column, we have a very fair representation of how the tangential component is integrated at any moment from the circle of quadrature towards the points under and opposite the moon.

Whilst the maximum value of the normal component at A and B is greater than the tangential, its effect is not magnified to anything like the same extent by integration. The particles in the vertical column of water under the moon press upwards upon one another in consequence of her attraction, just as the weights in a pile press down upon those beneath them under the influence of gravity, but the integration is at most through five miles depth of water, instead of through 6,000 miles of what is known as " fictitious horizontal depth " (on the equator and in open water).

At A and B where tidal force on the particles is a maximum and where although there is no tangential component its *effect*

is a maximum through integration, the greatest elevation will take place to form the apices of the tidal cones. In the diagram the cones are purposely exaggerated and slightly detached to indicate that they do not rotate with the earth but remain under and opposite the moon. Rotation in the direction of the arrow would produce the same effect as if the moon and the graduated ring revolved in the opposite direction. On a globe covered



DEPRESSIONS NOT SHOWN.

with water the cones would accompany the apparent motion of the moon, the water forming them gradually but continually changing by the rising of particles in front of her path and the subsidence of those left behind.

On our actual world where these conditions obtain in the Great Southern Ocean, observation shows that the same results are found along the 45th parallel (and farther north where there is sufficiently open water) except in the neighbourhood of the South American Continent, which stretches down to Lat. 56° to obstruct the progress of the tidal wave.

It will readily be seen by the diagram that a lake or sea of limited dimensions can only coincide at any given moment with a small fraction of the ring representing tangential force. In this case it is obvious that at the ends of the lake H.W. will not be under the moon, but when she is three hours East or West of its centre bringing the portion of the ring where tangential force is greatest over the sheet of water. Integration throughout the *whole* quadrant is always greatest where it meets the other quadrant, however the weights (or pressure) are distributed, just as the lowest weight of an irregular column bears the pressure of all those above it, no matter how they are arranged, but over a small arc integration must necessarily be more effective where the weights (or pressure) are a maximum, which in this case is obviously in octant. In the centre of the lake, however, which remains at mean level while H.W. occurs at the ends, the greatest elevation will be when the moon is vertically over it.

New Proofs.

The Co-tidal Charts have always shown the tide under the moon in the Southern Indian Ocean, including the islands of Amsterdam and St. Paul. The Admiralty Tide Tables for 1912 place the tide under the moon at Tristran D'Acunha and at a number of small islands south of New Zealand. It has always been to these islands standing as Nature's tide gauges in the only deep and unobstructed waters of the globe that we have looked with confidence for such confirmation as must convince the most sceptical. They have no land for thousands of miles either to the eastward or the westward to cause retardation and so may be considered a fair and conclusive test.

On the other hand, the tides of islands several hundred miles eastward both of Patagonia and New Zealand, such as S. Georgia and Chatham Is. suffer considerable retardation from the land in front of the tidal wave. Stewart Island is not only a proof of our main contention, but also an excellent example of the rapidity with which retardation is produced by land and shallowing sea-floor. Too small to be an obstruction until the tide arriving with the moon is in actual contact with the island, the friction of its shores causes 70 minutes retardation in the H.W. of Paterson Inlet on the East Coast and at Mason Bay on its Western side.

RECOLLECTIONS IN PORTUGAL AND SPAIN DURING 1811 AND 1812.

By CORNET FRANCIS HALL, 14th Light Dragoons.

(*Continued from November* JOURNAL, *page* 1535).

CHAPTER VI.

A SKIRMISH.

[Carpio, Sept. 25th, 1811.]

[*A gap in the Reminiscences between August and December*, 1811, *can be partly filled up by a letter, herewith given.*]

In September, 1811, the main stress of the Peninsular War was transferred from the Caya and the neighbourhood of Badajoz back to the frontiers of Leon, whither Marmont had betaken himself, in order to deliver Ciudad Rodrigo from blockade by Wellington, who had once more moved up to the northern theatre of operations. Having strengthened himself with the greater part of Dorsenne's Army of the North, he not only threw a convoy of provisions into Rodrigo, but marched out from it and drove Wellington back three or four days' march into Portugal. In the commencement of this short campaign the 14th was engaged. On September 25th fourteen squadrons of the Imperial Guard Cavalry advanced to the Azava, driving back the British cavalry screen, and the Lancers of Berg crossed the river in pursuit. They were immediately charged and driven back by a squadron of the 14th and two of the 16th Light Dragoons. Hall writes:

Povoa d'El Rey, Oct. 20, 1811.

"By a diabolical blunder I am afraid you will have seen my name in the *Gazette* as slightly wounded. It is true, I got a scratch on the 25th, but it was so slight that the Adjutant promised not to return me as wounded, and he afterwards sent in my name without my knowledge, that our regiment might make some show in the business. A bit of plaster healed up my whole grievance in a day or two. The way I got the hurt was in a charge of Lancers. An ill-looking Frenchman hit me with his spear—however, they got paid back with a few broken heads.[1] This disturbance has shifted us out of our Spanish quarters into the dog-holes of Portugal. This place (Povoa) is the very dwelling of filth and misery . . . . Quarters in a

[1] The official returns give—Carpio, Sept. 25th, 14th Light Dragoons, Lieutenant Hall, 2 men, and 2 horses wounded.

Portuguese village are beyond comparison more dull and lifeless than the 'country quarters' in England. I don't think the poor people have even time for scandal: their hours are sufficiently occupied in gaining a miserable subsistence. The only variety in their lives is caused by their inmates, our soldiers, who sometimes burn a house for firewood, and sometimes steal what few things the French have left them. When our armies first came the inhabitants of every village offered us their choicest, and thought themselves honoured by our acceptance of it. Wherever an officer was quartered, the people of the house were affronted if he did not live with them. They have since grown poorer—and wiser!"

CHAPTER VII.

CELORICO (A HOSPITAL STATION).

[December, 1811.]

I passed a considerable portion of the winter season of 1811-12 on duty at Celorico, one of the principal hospital stations for the army. The town is as miserable as a Portuguese town, and a hospital station to boot, need be—but its site is grand in the extreme. It stands on a tongue of land, towering boldly from the Mondego, which flows round its base at the distance of about a mile through a fertile valley, towards the south and east, when it turns short to the west, and seems to bury its broken stream in deep chestnut woods. The town is divided into two parts by a precipitous rock, crowned with the ruins of a large castle, at the foot of which the road runs along a superb natural terrace, commanding a fine view of the southern valley of the Mondego, with the Estrella mountains on the horizon, and immediately beneath, rich groves of olive trees, from which the voices of the girls and women, singing in chorus as they gathered the fruit, were distinctly, and thus mellowed by distance, harmoniously, audible. Nature, however, is little indebted to art; there are, indeed, some large houses, convents, and churches, to be found among the narrow dirty streets, but they were all now converted into barracks and hospitals, so had lost the little of good looks they could once boast. On my first arrival I was crammed into the miserable dwelling of a muleteer, whose daughter lay dangerously ill of a fever. He and his wife, however, accommodated me as well as they could, and even shared their dinner with me, when they found from the delay of my servant and baggage, I could procure none for myself. I was afterwards better lodged in the house of a gentleman of Trancoso, who dined with me when he came to visit his property in Celorico, and sat, either with real or pretended satisfaction, beside a fireplace I had made by blocking up one of his windows. It is at an hospital station and not on a field of battle that the calamities of war are best estimated.

When the reader of the *Gazette Extraordinary* has sighed over the returns of killed and wounded, and exclaimed, "Ah! poor fellows, war is certainly a shocking thing," he believes he has paid his full tribute of sympathy to its calamities and lamented everything that is lamentable about it. He is ignorant that for one man who meets an easy and comparatively enviable death in the field, at least 20 descend to an obscure grave at the hospital station. During the autumn of 1811, at Celorico only, from 50 to 100 men were buried daily (it was observed that the men who had been at Walcheren were the first to be attacked by fever in the Peninsula, and were seldom known to recover), and even after I arrived in the winter, from ten to twenty corpses were carried daily through the streets with scarcely the fragment of a tattered cloak, or a few boughs, to shroud their ghastly remains, and in this state were flung into a hole, which constituted a common receptacle without the town. Death was too common a guest to be treated ceremoniously. During the sultriest part of the season the crowded state of the hospitals (an evil irremediable, perhaps, considering the means of accommodation) tended greatly to increase the virulence of contagion. Two patients occupied each bed, and when one died another was brought in to fill his place, and share in mind as well as body, the infection of his disease. Another evil, even more fatal, arose from the want, or worse than the want—the ignorance of the medical staff. There were doubtless at the head of the department men both skilful and conscientious, but amid such a pressure of duty, they could do little more than give a very general inspection to the several hospitals, while the detail of management fell upon hospital mates, many of whom were grossly inattentive and ignorant of the first rudiments of their profession. Nor is this extraordinary. The demand in this branch of the service was very great, the pay very small, the prospect unattractive. Few young men, therefore, of education and promise would give up the chance of establishing themselves at home, and hazard their lives upon so barren a speculation: the void was consequently filled up without much scrutiny into the qualifications of the candidates. If, therefore, a few young men of talents and information were still to be found among the ignobler band of hospital mates (and my own experience justifies me in affirming there were a few such), it must be ascribed rather to extraordinary good luck, than to any merit in the system according to which they were selected.

Another evil in the medical department was the fraudulent application by the hospital mates of the comforts[1] intended for the sick to their own use. Nor do I mention this as ground of severe reproach to them. I doubt if in their situation I

[1] Such as poultry, wine, spirits, tea, sugar, lemons, etc., which were delivered from the Commissariat store, upon a receipt signed by the medical officers of the several hospitals.

should not have acted in the same manner. They were frequently several months without pay; they were not allowed the indulgence of a soldier as their servant. Their duty required an incessant attendance of the most painful nature, and I am convinced that for young men accustomed at least to the ordinary comforts of life, there were few whose constitutions could have supported, especially if they were conscientious in the discharge of their duty, the fatigue they must have undergone, both in mind and body, on the ration allowance of a pound of lean, tough beef, as much bread or biscuit, often mouldy, and a pint of sour wine, fit to be used as vinegar. Besides, however, the probable detriment of the sick, whose comforts were thus diverted into another channel, and the degradation of the *medicos* themselves, who were thus subjected to the familiarity and contempt of the sergeants and orderly men attached to the hospital, the loss thus occasioned to Government was, as I had once the curiosity to calculate, more than equivalent to such an addition to their pay as would have placed them above the necessity and temptation of having recourse to means, from which, as gentlemen, they must have revolted with disgust and shame. If the situation of the sick soldiers was far from what humanity would have wished it, that of the officer under similar circumstances was still more deplorable. No provision was made for his accommodation in the hospital, and if he was below the rank of a field officer, he could look for little comfort in a quarter. To prevent exactions on the inhabitants, an order has been issued limiting the claim of quarters to the bare rooms the individual was, according to his rank, entitled to. In such towns as Coimbra, Abrantes and Celorico, where the depôts of sick had been long established, and the inhabitants had from habit grown callous to their wants and sufferings, this order was literally acted upon, and the officer who arrived from the army exhausted with pain and disease, found nothing but the floor on which to lie.

In such a condition, too frequently without the means of procuring the most trifling of those comforts which nature craves in sickness, without nurse, friend, or attendance beyond what his servant could give him, how many a gallant officer has breathed his last, and been consigned to earth as leaves drop unnoticed into the brook and are swept from human observation. Why, it may be said, recall the remembrance of these things, which were but links in the chain of inevitable calamities war drags with it? Because the calamities of war have been too commonly veiled with the robe of triumph; because the destruction of mankind has been too long considered as a kind of "*grande chasse*" in which the rulers of the earth may legitimately indulge, upon the slightest pretexts of provocation; because too many of their subjects have flattered this propensity, by exaggerating the value of conquest and diminishing its concomitant evils. Could kings and their

ministers, with all those who talk loudly of the glories of the great Frederick and all such great dealers in butchery, be induced to make a visit during a campaign, not to the headquarters of the Army, where all is gallantry, animation and abundance, nor even to the field of battle, where reflection may be well drowned in the pealing shouts or deafened amid the clash and thunders of the contest, but to the rear of the scene of action, amid the villages which have been demolished and plundered, the families who are dying of disease and hunger, the sick who are tossing in the loathsome wards of a hospital! These are sights which might perhaps teach them that it is not a light cause can justify the infliction of so much misery. That the facility with which the passions or prejudices of the multitude may be inflamed into a temporary approbation of a war, is no criterion by which to judge of its practice: a less fallible one is to be found in its moral consequences. If a nation comes out wiser and happier from the contest, it is a strong presumption she has not unadvisedly engaged in it—but how seldom have Governments this strong presumption in their favour!

I grew weary enough of Celorico, where I almost found the contagion of disease had "made men mad." I was met one day on my return from my rambles by my Portuguese boy, who with a face of horror conducted me to the stables, where I found my servant, a dragoon, had cut his throat and lay dead on the straw. He had just recovered from a fever, and this act might be the result of a consequent debility of intellect. "I could better have spared a better man," for he was an excellent campaigner, though of lax moral habits. Soon after this event I lost my medical companions, who quitted Celorico. My quarter was next turned into an hospital, and I shifted into a room over a wine shop kept by a pretty Portuguese landlady, so it may be supposed there was little peace in it day or night. At length, after a two months' Babylonish captivity, I gladly set off to join the regiment.

THE WAR IN THE BALKAN PENINSULA.[1]

(*Continued from the November* JOURNAL, *page* 1620).

A.—MILITARY OPERATIONS: Operations of the Bulgarian Armies; Operations of the Servian Armies; Operations of the Greek Armies; Operations of the Montenegrins. B.—NAVAL OPERATIONS. C.—POLITICAL: Peace Negotiations; Attitude of Neutrals; Conclusion of the Armistice.

(A) MILITARY OPERATIONS.

Operations of the Bulgarian Armies.

SITUATION IN FIRST WEEK OF NOVEMBER.—The situation at the beginning of November in the Eastern Theatre of War was as follows:—

The Turkish Eastern Army had lost the great battle (Oct 29th—Nov. 2nd) on the line Lule Burgas—Bunarhissar; the left wing had fallen back in some disorder to Chorlu (November 1st); the right wing had gained a temporary success and had then also fallen back (November 3rd); a general retirement of the whole army to the Chatalja lines had then commenced.

The Bulgarian Second Army (Ivanoff) reinforced, it is said, by 45,000 Servian troops, continued the siege, or blockade, of Adrianople; the First and Third Armies appear to have remained stationary till November 7th. At any rate the right wing did not advance from Lule Burgas till that day. The delay may have been due to difficulties of supply or lack of ammunition. The absence of any cavalry pursuit is perhaps accounted for by the despatch of a large portion of the Bulgarian cavalry down the Maritza Valley to operate against a Turkish force near Gumuljina (see below).

"MYSTIFYING AND MISLEADING."—The week's delay in the Bulgarian operations (November 1st—7th) was carefully concealed at the time. Reports were disseminated in the Press by a correspondent who claimed to have the information from the Bulgarian headquarter staff—of a second three-days' battle about Cherkesskeui, in which the Turks were alleged to have been routed and driven back, closely pursued, on the Chatalja Lines, where the Bulgarians were stated to have gained a footing on November 8th. The falsity of these reports was exposed by the *Times* correspondent on November 13th, but by this time the need for concealment was past.

The Turkish rearguard left Chorlu on November 6th and fell back to the Chatalja Lines covered by Salih Pacha's Cavalry Division. The Bulgarian armies advanced on both sides of the railway.

On the 11th November the right wing of the First Army, including some Servian troops, drove the Turks out of Rodosto. On November 13th,

[1] Though hostilities have been suspended there has been little relaxation of the secrecy observed at the outset of the campaign. The accompanying narrative is compiled chiefly from *Danzer's Armée Zeitung, Marine Rundschau, Militär Wochenblatt,* the *Temps,* and *Questions Diplomatiques et Coloniales;* and from telegrams in the British Daily Press.—Ed.

the Turkish advance posts west of the Kara Su were driven in, and the Bulgarians commenced entrenching their batteries opposite Hademkeui.

The Turkish forces east of the Kara Su are now said to have consisted of 80,000 to 100,000 men; of these about 60,000, reorganized in three corps, were in the Chatalja position, viz., Ist Corps on the left near Biyuk Chekmeje; IInd Corps near Hademkeui; IIIrd Corps on the right wing near Lake Derkos; in addition, there were said to be two reserve corps, viz., Ist Reserve Corps near Tursunkeui, IInd Reserve Corps near Sasli Bosna. The losses of the field army during the three weeks of the campaign were estimated at 35,000 killed and wounded, and at least 20,000 missing.

The absence of any pursuit and the arrival of ample supplies had enabled the Turks to recover from their disorganization, which seems to have been due to want of food as much as to any other cause. At the same time there seem to have been large numbers of stragglers in rear of the lines, while cholera was making ravages among the troops and civilians.[1]

The Bulgarian force, assembled in the peninsula about November 15th, is estimated at eight divisions, with a strength of about 140,000.

THE CHATALJA LINES.—The Chatalja position is formed by a chain of heights running across the peninsula, east of the marshy valley of the Kara Su. The lower part of this valley is filled by the Biyuk Chekmeje Lake, which is crossed at its narrowest point by the bridge carrying the coastal road. On the northern side of the peninsula the lines are flanked by the Derkos Lake, which is separated from the Black Sea by an isthmus half a mile wide. The length of the position is 30 miles from sea to sea, or 18 miles between the lakes. The chief approaches to the position are by the main road and railway, near Hademkeui.

The defences, prior to the war, were said to consist of three tiers of works, a chain of old redoubts designed by Bluhm Pacha on the rear crest, and two tiers of works constructed under the advice of British officers, on the crest and down the forward slope, commanding the valley. Three modern forts with concrete bomb-proofs had been added at the suggestion of Brialmont, and further improvements had been effected, more recently, by German engineers. According to Captain Stavenhagen[2] there were, in 1909, 110 works of all sorts, requiring a garrison of 80,000 troops, with 250 fortress guns and 150 field pieces. In recent years the works had been neglected, and many of the guns had been moved to Adrianople. The position is said to be weakest just south of Lake Derkos, where the field of fire is limited by wooded hills to the west.

On November 17th the Bulgarians unmasked their batteries, and commenced an attack on the two Hamidieh forts, and on the right of the Turkish line. From information at present available it does not appear that the attack was more than a reconnaissance or demonstration, which may have been carried too far in some places, owing to the zeal

[1] Cholera was first reported among the Turks about the beginning of November. On the 14th, 500 cases were reported daily, with a total up to that date of over 6,000. The disease appeared then to be subsiding under the influence of the cold weather. The Bulgarians were also suffering from cholera and appeared to be in a somewhat exhausted condition.

[2] Die Küsten-befestigungen der Ausserdeutschen See Staaten.

of the troops. The Turkish warships rendered effective assistance to the defence on both flanks. The Bulgarian batteries suffered from being commanded by the heavier Turkish guns on the high ground. Mahmud Mukhtar Pacha was wounded in the fighting on the right (north) flank.

Having apparently decided that the lines could not be captured by a *coup de main*, General Savoff broke off the engagement and withdrew his troops out of range of the fortress guns. The Turks were much elated by the failure of the attack, and claimed a victory. Meanwhile, negotiations for an armistice had been commenced, but on November 21st Turkey definitely rejected the conditions offered and hostilities were resumed. Negotiations were, however, re-opened, and no serious land fighting took place in this quarter till the signature of the armistice (December 3rd).

The Turks profited by the delay to strengthen their position, and to form second and third lines of defences in rear. The *moral* of the army was now completely restored and the troops were said to be eager to take the offensive, if the negotiations broke down.

There seems, however, no reason to credit the Turkish army with greater offensive power at this time than a month earlier. The old difficulties of organization and administration would have re-asserted themselves as soon as an advance was begun, while the loss of practically all their quick-firing field guns placed them, tactically, at a great disadvantage.

The reports of an intended attack on the Dardanelles led the Turks to strengthen their forces in the Gallipoli Peninsula, to the command of which Torghud Shefkhet Pacha was appointed. Some Kurdish and Hamidieh cavalry were shipped across the Sea of Marmora to operate in the Kuru Dagh and Tefkur Dagh hills (just north of the peninsula).

After the attack on the Chatalja Lines (November 17th—19th), the greater part of the Bulgarian forces were withdrawn west of Chorlu, and billeted over a wide area along the railway, covered towards the east by a line of entrenchments about Kalissakeui and Chielskeui. It was said to be General Savoff's intention to make no further attack on the Chatalja position, but to leave it to the Turks to attack him, out of range of their fortress guns. A large number of Bulgarian troops are said to have been despatched from the front towards Adrianople. It appeared probable that—with a view to the impending armistice—a great effort would be made to capture that fortress.

The recruits of the 1913 and 1914 year-classes were called out to replace losses, and left for the front about November 25th, after a short training.

SIEGE OF ADRIANOPLE.—The garrison (originally 50,000) under Shukri Pacha, continued to make an active defence. It does not seem that the Bulgarian siege train was adequate for its task. The outlying forts on Kara Tepe and Papas Tepe were captured on November 10th, but otherwise no serious impression had been made on the main defences at the end of November. On November 22nd, and again on the 26th—27th, a heavy bombardment was reported. An attempt by the garrison to break out southwards was repulsed on the 24th.

OPERATIONS OF THE BULGARIAN RHODOPE ARMY.—The Bulgarian force which crossed the Jumaa-i-Bala Pass in October appears to have divided into two columns. The eastern column (General Todoroff), said to consist of two brigades 7th Division about 20,000 strong, descended the Struma Valley and advanced on Salonica, which it entered on November 9th, on the day after the Greek occupation, and was then stationed partly at

Salonica and partly at Serres. The western column descended the Mesta Valley, occupied Drama (October 26th) and then worked towards Gumuljina, clearing the country of hostile detachments.

Of these, the largest was a force of two *Redif* divisions (20,000 men) under Mehmed Yawer Pacha, which had been at Kirjali at the outbreak of war, and had been driven back about October 20th on Gumuljina (probably by the Bulgarian 2nd Division), where it constituted a threat on the army investing Adrianople and on the communications east of the fortress. During November, operations against Yawer Pacha's force were undertaken by several columns, one, mainly of infantry which advanced from Kirjali, directly on Gumuljina; a second, mainly of cavalry which moved along the right bank of the Maritza, to cut the Turks off from Dedeagach; a third column, also consisting chiefly of cavalry, went in the same direction. The Mesta Valley column under General Kovacheff also co-operated in the movement. The operations are described in the Bulgarian official report as follows[1]:—

"On November 22nd the column which was marching along the right bank of the Maritza attacked the Turkish positions before Dedeagatch and captured the town on the following night. However, the commander of the column, on hearing that a strong column of the enemy, consisting of 4,000 or 5,000 troops, was advancing from Gumuljina, decided to retire towards Bedekli while leaving a cavalry detachment at Fere for reconnoitring purposes.

"This occurred on November 24th. Six days previously, November 18th, the infantry column of Kirjali left that place for Mastantli, where there were approximately two Nizam companies, two Bashi-Bazouk companies, a mountain battery, and two machine guns, and on the 19th it attacked the Turkish position, the evacuation of which it compelled, and drove the Turks back on Gumuljina. The enemy retreated in disorder, leaving large quantities of ammunition and war material along their line of retreat, and near the village of Baktachler an encampment of 70 tents.

"On the 22nd the town of Gumuljina was captured by the Kirjali column, but the Turks succeeded in retiring along the railway track to Fere station, covered by the rearguard. On the 25th the Kirjali column in pursuit of the enemy reached Fere, where it got into communication with the cavalry column descending the right bank of the Maritza. The Turks then left Fere for Marhamli, where they took up their positions a little to the north of that village. On the 26th, after an artillery duel which lasted until two o'clock in the afternoon, the Turks raised the white flag and sent envoys to the Bulgarian camp to open negotiations, but their terms were unacceptable. On the following day at two o'clock in the afternoon the Turks surrendered finally.

"Those taken prisoners included Mehmed Yaver Pasha, Commander-in-Chief of the Kirjali Army Corps, his Chief of Staff Hamdi Bey, both divisional commanders, 265 other officers, and about 12,000 non-commissioned officers and men. Eight mountain guns, two machine guns, 1,500 horses, and quantities of war material and ammunition were also captured by the Bulgarian troops."

The small number of guns surrendered is remarkable.

The Bulgarian force which entered Dedeagach on November 22nd captured large quantities of rolling stock. A portion of this force diverged

[1] From the *Times* Sofia correspondent, dated December 2nd.

at Ferejik junction on the 19th and occupied Malgara (half way between Ferejik and Rodosto). This move was perhaps intended—as suggested by the *Temps*—to guard against a possible offensive by the Kurdish cavalry in the Kuru dagh.

Between November 23rd and 27th one of Todoroff's two brigades (12,000 men) was embarked at Salonica in Greek transports and was landed at Dedeagach about November 28th to December 1st.

Operations of the Servian Armies.

SITUATION AT BEGINNING OF NOVEMBER.—The situation of the Servian Armies at the beginning of November appears to have been somewhat as follows:—(See November JOURNAL, page 1633).

After the occupation of Uskub (October 26th) a force, said to consist of the two 2nd *Ban* Divisions of the Danube and Timok (Second Army) under General Stephanovich, was despatched by rail, via Sofia, to assist the Bulgarians in Thrace. Another portion of the Second Army, consisting chiefly of cavalry, pushed down the Vardar Valley to Salonica. The First Army, consisting of the four 1st *Ban* Divisions of the Drina, Danube, Morawa and Timok advanced along the Perlepe—Monastir road in pursuit of the Turkish Western Army (Vth, VIth, and VIIth Corps), which had lost all its artillery, except that of the Vth Corps, at Kumanovo (October 24th). The Turks stood to fight near Perlepe, which place was captured by the Servians on November 6th after a two days' battle. Here the advance appears to have been suspended for a week, owing, perhaps, to difficulties of supply and to a heavy snowfall which commenced on November 7th.

Another pursuing column, apparently from the Third Army (said to include the Morawa 2nd *Ban* Division) pursued a Turkish detachment which had been unable to join the main army's retreat, westwards to Kalkandele, thence to Gostivar (November 3rd) and thence to Kirchevo; here the Turks were reinforced by the garrison and stood to fight, but were again defeated. This Servian pursuing column appears then to have turned southwards to co-operate with the First Army's advance from Perlepe on Monastir, but a detachment is said to have been left to subdue the country round Dibra.

THE BATTLE OF MONASTIR.—The First Servian Army resumed its advance about November 14th. Its strength is estimated at 60,000 and that of the right wing detachment moving southwards from Kirchevo at 25,000. The object of the latter force appears to have been to envelop Zekki Pacha's right wing and prevent his retreat towards Okhrida. The battle which followed is thus described by the correspondent of the *Temps* (dated Uskub, November 23rd):—

"The Turks had three corps and two independent divisions; the left wing consisted of the VIth Corps (Djavid Pacha); in the centre was the VIIth Corps (Fethi Pacha); on the right was the still unbeaten Vth Corps, directly under Zekki Pacha. The Servian troops were assembled on the left bank of the rapid River Cerna, the crossing of which cost many lives, as the men had to wade waist deep. The Turks were driven out of some strong entrenchments on the right bank and retired to some positions on high ground round Monastir.

"On the second day of the battle (November 18th) the Servian Army was disposed as follows:—Right wing, the Morawa Division;[1] centre the

[1] It is not clear if this was the Morawa 1st *Ban* or 2nd *Ban* Division.—Ed.

Drina Division; left wing the Danube Division. On the Perlepe road (i.e., apparently in reserve) the Timok Division. Most of the fighting was with the bayonet. On the fourth day Zekki Pacha commenced falling back towards Florina; Djavid Pacha made a desperate effort to break out towards Okhrida, while Fethi Pacha sought to find a way out of Resna."

It appears that a dense fog prevented the Servians from reaping the full reward of their victory. Their spoils included the greater part of the Turkish artillery, besides 12 guns recently captured from the Greek 5th Division near Florina.[1]

The first Servian despatches announced the capture of the whole Turkish Army, but later reports give the number of prisoners at 5,000 with 66 guns. The Turks appear, however, to have been dispersed in disorder among the mountains, except for a small portion which broke through to the north-west, and a larger body which escaped by Florina towards Yanina. A large number of fugitives fell into the hands of the Greek columns near Florina. The Servian cavalry pursued as far as the latter place, capturing ten more guns and making many prisoners. Fethi Pacha was among the slain.

The Servian headquarters were transferred from Perlepe to Monastir on November 21st. The Morawa Division captured Resna on November 21st. A force was despatched via Dibra (November 29th) and Elbassan (December 1st) to Tirana, where touch was to be gained with the column from Alessio. (See below).

OCCUPATION OF ALESSIO AND DURAZZO.—After the capture of Usikub a portion of the Fourth Servian Army (15 battalions, three squadrons, two field batteries, two howitzer batteries and six machine-gun companies) which had been operating in the Sanjak of Novi Bazar commenced a march to the Adriatic coast, moving in two columns, viz., (1) eight battalions of the 2nd *Ban* Drina Division via Ipek (November 5th) and Djakova (November 10th) thence by the Drin Valley; (2) seven battalions of the 2nd *Ban* Shumaja Division via Prisrend (October 31st) across the country of the Mirdite clan, who received the Servians cordially. The march across the mountains was of exceptional difficulty owing to the deep snow and the lack of supplies. The occupation of Alessio was carried out on November 17th with the assistance of five Montenegrin battalions under General Martinovitch. After resting a short time at Alessio the Servian force, accompanied by some thousands of Malissori, continued its march southwards along the coast towards Durazzo. After encountering new difficulties owing to the flooded condition of the Rivers Mati, Ishmi, and Arsen, the column entered Durazzo on November 28th. A Congress of Albanian notables under Ismail Kemal Bey, at Valona, proclaimed the independence of Albania.

Operations of the Greek Armies.

SITUATION IN FIRST WEEK OF NOVEMBER.—The situation of the Greek Armies at the end of the first week of November was as follows:—(See November JOURNAL, p. 1631). The main Greek Army under the Crown Prince had defeated the Turks at Yanitza (Yenidje Vardar) and Plati Bridge on November 2nd, and had entered Salonica on the 8th, receiving the surrender of Hassan Tahsin Pacha and 29,000 Turkish troops. The march across the plain from Yenidje to Salonica was especially difficult

[1] See under the operations of the Greek Armies.

owing to the swampy ground and the necessity for crossing the Rivers Aliakmon, Axios and Gallikos. The 5th Division had been detached from the main army at Kozani on October 26th to follow the retreating Turks towards Monastir. On November 4th it engaged the Turkish rearguard at Nalbandkoi and on November 24th it was reported to have checked its advance near Banitza owing to the Turks in front of it having been reinforced. The commander of this division stated, in an interview, that he was opposed near Banitza by 15,000 Turks. As he had only 4,500 men, fatigued with rapid marching, he fell back on Sorovech (on the railway west of Vodena) where he entrenched himself and beat off several attacks (November 3rd—5th). On the morning of the 5th his right wing was surprised and he had to fall back three miles. Considering that his task was accomplished—the Turks at Monastir having been prevented from moving on Yenidje—and having regard to the exhaustion of his troops, he then retired to the villages near Kozani. Twelve Greek field guns, recaptured by the Servians at Monastir (November 19th) appear to have belonged to this division.

On November 15th the Crown Prince with his main army left Salonica, marching in two columns, one via Kailar which picked up the 5th Division on its way, and one by the direct Salonica—Vodena road, on Monastir. The two columns united near Banitza about the 20th, meeting little opposition, as the whole Turkish force was concentrated against the Servians; but their approach no doubt influenced the result of the battle. As it was, they captured large numbers of prisoners and some guns in the defiles of Pisoderi and dispersed some bodies of Turkish troops retreating via Florina.

On November 25th the Greek cavalry, supported by an infantry division, attacked Kastoria (south-west of Sorovech) capturing more prisoners and guns, and then pushed on towards Yanina.

OPERATIONS IN EPIRUS.—On November 14th General Sapundzakis (20 battalions) captured Mount Metsovo, in rear of the Turkish position covering Yanina. On the 28th the Greek troops appeared before that fortress, the defences of which are said to be of little value. The defenders numbered about 25,000 (not 4,500 as reported in last month's JOURNAL) and have since been reinforced by the debris of the Western Army from Monastir under Djavid Pacha. At the end of November the Greek force was being strongly reinforced from Arta.

Operations of the Montenegrin Armies.

These operations led to no decisive result in November. The defences of Scutari proved too strong for the Montenegrin guns. Moreover, the weather rendered siege operations very difficult. An attack on the fortress was repulsed on November 7th. The defence was active, and repeated sorties were made against the investing troops.

At the beginning of November General Martinovitch (five battalions) advanced against San Giovanni di Medua, apparently reducing the besieging force round Scutari to a minimum. This advance at first met with a check, but on November 16th San Giovanni di Medua was occupied. The following day General Martinovitch, in conjunction with a Servian force, captured Alessio, but on the 23rd the Montenegrin force was recalled to Scutari.

Newspaper reports dated November 13th showed that about that date the Montenegrins were in considerable difficulties owing to the defection of certain Albanian tribes.

On the 28th all the Montenegrin forces—except some detachments in the Sanjak—were ordered to concentrate round Scutari; the King took over the supreme command with General Vukovich as Chief of the Staff; the Crown Prince was given command of the Zeta and Eastern brigades.

(B) NAVAL OPERATIONS.

GREEK FLEET.—The Greek Fleet consisting of the "Averoff," 14 destroyers and six torpedo-boats and one submarine put to sea on October 17th. Some destroyers were despatched to the Epirus coast to establish a blockade; the remainder operated in the Aegean. Mudras Bay (Lemnos) was occupied on October 21st, as a base against the Dardanelles; subsequently the islands of Thasos, Imbros, Samothrace, Tenedos, Chios, Ikara, Psara, Strati and Mitylene were captured by the Fleet.

A Turkish gun-boat was sunk in the harbour of Aiwali in Asia Minor on October 23rd. On October 31st the old Turkish cruiser "Feth-i-Bulend" was torpedoed in Salonica Harbour as described in last month's JOURNAL.

The action of the Greek Fleet in the Aegean not only prevented the transport of Turkish troops by sea to Macedonia, but stopped the importation of coal for the Asiatic railways, thus hindering the Turkish concentration.

The four torpedo-boats purchased in Argentina reached the Piræus on October 22nd.

TURKISH FLEET.—In spite of the obvious advantages to be gained by a naval victory in the Aegean the Turkish Fleet (three battleships, two cruisers, 20 torpedo craft) did not issue from the Dardanelles. Its action was limited to the bombardment of Varna and Kavalla (October 20th); convoying troop transports from Sinope and Trebizond to Constantinople, and support of the flanks of the Chatalja lines (November 10th-20th).

Its existence as a "fleet in being" did not prevent the transport of Todoroff's brigade by sea from Salonica to Dedeagach at the end of November.

BULGARIAN FLOTILLA.—The Bulgarian flotilla, consisting of six torpedo-boats, was driven into Varna Harbour by the Turkish Fleet on October 19th. On November 21st at 12.15 a.m., about 15 miles off Varna, four Bulgarian torpedo-boats steaming in line ahead encountered the Turkish cruiser "Hamidieh," which cut through the line astern of the leading boat. The second boat fired a torpedo which hit the "Hamidieh" forward causing serious damage. The torpedo-boats continued the attack at long range up to 3 a.m. without further success. The "Hamidieh" reached the Golden Horn on the 22nd considerably down by the head.

(C) POLITICAL.

PEACE NEGOTIATIONS.—On November 3rd the Porte appealed to the Powers, through France, to compel the Allies to arrange an armistice. No mention was made of conditions nor of guarantees offered by Turkey, and the appeal was, therefore, at once rejected. On November 5th the

Porte again appealed for mediation. France replied that she would willingly join in any steps which did not involve bringing pressure on the Allies; it is understood that similar replies were given by other Powers.

The Balkan States on their part insisted that Turkey should negotiate directly with them.

On November 13th Kiamil Pacha, abandoning all hope of mediation, commenced negotiations with Bulgaria for an armistice. The conditions demanded by the Allies are said to have included the surrender of Scutari, Yanina, Durazzo and Adrianople, the evacuation of the Chatalja Lines, and the raising of the blockade of the Black Sea coast.

These conditions were definitely rejected by Turkey on the 21st, and it was announced that the war must continue. Nevertheless, discussions continued; Nazim Pacha, Prechid Pacha and Osman-Nizami Pacha representing Turkey, and General Savoff, General Ficheff and one delegate from Greece and one from Montenegro representing the Balkan League. The first meeting was held on November 25th at Bagtchekeui, a village between the two armies.

Attitude of Neutrals.

AUSTRIA-HUNGARY.—The demand of Servia for access to the Adriatic gave rise to a difficult situation in Europe. The Servian view, as set forth by M. Pashitch, the Premier, in a communiqué to the *Times* (Nov. 24th), was that the possession of the country between a line from Alessio to Djakovo on the north, and Durazzo to Lake Ochrida on the south, together with the coast line from Alessio to Durazzo (inclusive) was the minimum necessary to ensure the economic independence of Servia. The Austrian view, as semi-officially stated in the *Fremden Blatt*, was that Servia's desire for a port was regarded as quite natural so long as that port was not on the Adriatic. On November 8th the Austrian views on the final settlement were communicated to Belgrade; they were stated in the semi-official Press to include:—

(1) Guarantee of complete commercial freedom for Austria by the Salonica route. (2) The integrity of Albania. (3) Establishment of close commercial relations between Austria and Servia. (4) Compensation for Rumania. The situation was complicated by the fact that the Austrian Consul at Prizrend was, for reasons not yet known, temporarily prevented from communicating with his Government. On November 24th the Austrian Press reprinted an ordinance prohibiting the publication of news as to military preparations, movements of troops, etc. Numerous reports as to the partial mobilization and strengthening of frontier corps in Russia and Austria were published in the European Press. These reports were officially contradicted in both countries.

On November 22nd the Archduke Franz Ferdinand paid a two days' visit to the Kaiser at Springe, ostensibly to shoot boars; at the same time General von Schemua, Chief of the Austro-Hungarian General Staff, went to confer with Field-Marshal von Moltke, Chief of the German General Staff at Berlin.

GERMANY.—The Press observed a very guarded attitude on the subject of the points in dispute between Austria and Servia. It appeared that a European war would scarcely have appealed to the country as a whole, though there could be no question about Germany supporting Austria if the need should have arisen. During November the Italian Foreign Minister visited Berlin to return Herr von Kiderlen Wächter's visit of last

January, and was decorated by the Emperor with the order of the Black Eagle.

As already mentioned the Archduke Franz Ferdinand paid a visit to the Emperor, while the Austrian Chief of the General Staff came to Berlin to confer with the Chief of the General Staff. Chiefly through despatches to the *Cologne Gazette* the German Foreign Office endeavoured to soothe the public mind with explanations of these various visits. In the meantime preparations for war were quietly made, though no troops appear to have been mobilized; the issue of the notices to reservists as to place of rejoining was, however, made two months earlier than usual, the customary time being January in each year.

On December 2nd the Chancellor spoke as follows in the *Reichstag*:—

"If in giving effect to their interests our allies, contrary to all expectation, are attacked from a third side, and so find their existence menaced, we, in loyalty to our duty as allies, should have to take our stand firm and determined at their side."

On the same occasion the Foreign Secretary stated that "During the whole of the recent crisis our relations, especially to England, have been relations of peculiar confidence. The open conversation carried on in perfect confidence between London and us in all phases of this crisis has not only produced a happy intimacy in our relations, but has done good service to the promotion of agreement among all the Powers. I should like to express the confident expectation that this will continue to be the case."

RUSSIA.—The successes of the Balkan League gave great satisfaction in Russia. The friction which prevailed all through November between Austria and Servia led to many conflicting rumours as to a state of tension between Austria and Russia. The statements that Russia was mobilizing her troops on the western frontier early in the month were denied officially, the fact being that all men due to go in the reserve were kept on with the colours until further orders, but no reservists were called up. An official communiqué issued on 25th November declared that the reports of the hostile intentions of Russia towards neighbouring States, and the military preparations alleged in consequence, were devoid of foundation.

CONCLUSION OF THE ARMISTICE.

On December 3rd, after negotiations, in which the Bulgarian demand for the surrender of Adrianople was the chief difficulty, an armistice was signed at Chatalja between Turkey on the one hand, and Bulgaria, Servia and Montenegro on the other. The conditions were as follows:—

1. The belligerent armies remain in the positions they at present occupy.
2. The besieged fortresses shall not be revictualled:
3. The revictualling of the Bulgarian Army shall be carried out by way of the Black Sea and Adrianople, beginning ten days after the conclusion of the armistice.
4. Negotiations for peace shall begin in London on December 13th.

Greece refused to sign the armistice, owing, it is said, to her unwillingness to suspend operations against Yanina. She is also said to have demanded that Turkey should recognize her sovereignty over the islands captured by her during the war. The disagreement—if it be such—between the Allies had the effect of maintaining the maritime blockade of the Aegean.

NAVAL NOTES.

The following are the principal appointments which have been made:

Admiral H.S.H. Prince Louis of Battenberg, G.C.B., G.C.V.O., K.C.M.G., to be First Sea Lord, in succession to Admiral Sir Francis C. B. Bridgeman, G.C.V.O., K.C.B.

Vice-Admirals—Sir George Le Clerc Egerton, K.C.B., to be Commander-in-Chief, Plymouth, in succession to Admiral Sir William H. May, G.C.B., G.C.V.O.; Sir Henry B. Jackson, K.C.B., K.C.V.O., F.R.S., to be the Chief of the War Staff, in succession to Rear-Admiral Ernest C. T. Troubridge, C.B., C.M.G., M.V.O.; Arthur M. Farquhar, to be Admiral Commanding Coastguard and Reserves, in succession to Sir Frederick Inglefield, K.C.B.; Sir John R. Jellicoe, K.C.B., K.C.V.O., to be Second Sea Lord in succession to Prince Louis of Battenberg. Rear-Admirals—The Hon. Sir Alexander E. Bethell, K.C.M.G., to be in command of the Royal Naval War College, in succession to Sir Henry Jackson; Thomas H. M. Jerram, to be Commander-in-Chief, China, in succession to Admiral Sir Alfred L. Winsloe, K.C.B., C.V.O., C.M.G.; Frederick G. D. Sturdee, C.V.O., C.M.G., to be Rear-Admiral Commanding the Second Cruiser Squadron, in succession to Rear-Admiral Sir George J. S. Warrender, Bart., K.C.V.O., C.B.; Richard H. Peirse, M.V.O., to be Commander-in-Chief, East Indies, in succession to Sir A. Bethell; Herbert G. King-Hall, C.V.O., C.B., D.S.O., to be Commander-in-Chief, Cape of Good Hope, in succession to Vice-Admiral Paul W. Bush, M.V.O.; David Beatty, C.B., M.V.O., D.S.O., to be Rear-Admiral Commanding the First Cruiser Squadron, in succession to Rear-Admiral Lewis Bayly, C.V.O., C.B.; Sir Christopher G. F. M. Cradock, K.C.V.O., C.B., to be Rear-Admiral Commanding Training Squadron, in succession to Rear-Admiral Edward E. Bradford, C.V.O.; Ernest C. T. Troubridge, to the Command of the Mediterranean Cruiser Squadron; Charles E. Madden, C.V.O., to be Rear-Admiral Commanding the Third Cruiser Squadron, in succession to Rear-Admiral Sturdee; Arthur H. Christian, M.V.O., to be Rear-Admiral in the Home Fleets, Devonport, in succession to Rear-Admiral Henry L. Tottenham; the Hon. Somerset A. Gough-Calthorpe, C.V.O., C.B., to be Rear-Admiral First Battle Squadron, in succession to Rear-Admiral Madden; Dudley R. S. De Chair, M.V.O., to be Naval Secretary to the First Lord of the Admiralty, in succession to Rear-Admiral Beatty.

Captains—C. J. Eyres to be Assistant to Admiral Commanding Coastguard and Reserves; H. Blackett to "Dublin"; Mark E. F. Kerr, M.V.O.. to "King George V."; O. de B. Brock to "Princess Royal"; J. S. Dumaresque, M.V.O., to "Prince of Wales"; W. F. Slayter to Command of Royal Naval College, Greenwich; F. S. Miller to "Formidable."

The announcement of so large a number of important flag appointments so long in advance of the time when they will take effect, is a new departure on the part of the Admiralty. Sir George Egerton will succeed to the Plymouth command on the 20th March next, when Sir W.

May becomes an Admiral of the Fleet on the retirement of Sir Charles Hotham; Rear-Admiral Sir C. Cradock will succeed Rear-Admiral Bradford in command of Training Squadron in February next; Rear-Admiral Beatty will also hoist his flag in command of First Cruiser Squadron next February; Rear-Admiral Jerram will take over the China command in January, Sir A. Winsloe completing his three years in command on the 25th of that month; the China station is a Vice-Admiral's command, and in the ordinary course it will not be long before Rear-Admiral Jerram attains that rank. Rear-Admiral H. G. King-Hall will also hoist his flag almost immediately in command of the Cape of Good Hope station, Vice-Admiral Bush having completed his term of service on the 17th inst.

Rear-Admiral R. E. Wemyss, C.M.G., M.V.O., hoisted his flag in the "Orion" on the 29th October, in succession to Rear-Admiral H. G. King-Hall, C.V.O., C.B., D.S.O. Rear-Admiral R. G. O. Tupper, M.V.O., hoisted his flag on board the "Prince of Wales" on the 18th ult., as Rear-Admiral in the Home Fleet, in succession to Rear-Admiral A. Y. Moggridge.

The first-class armoured cruiser "Inflexible," which is relieving the "Good Hope" as flagship of the Mediterranean Squadron, left Sheerness on the 15th ult. for Malta, arriving on the 22nd, and leaving the next day for Besika Bay, which she reached on the 25th.

The first-class armoured cruiser "Shannon," flying the flag of Rear-Admiral Sturdee, arrived at Sheerness on the 10th inst. from Gibraltar, and relieved the "Indomitable," battle-cruiser, as flagship of the Second Cruiser Squadron on the following day. The "Indomitable" becomes a private ship in the First Cruiser Squadron pending orders to proceed to the Mediterranean. Rear-Admiral Sir G. Warrender struck his flag on board her at sunset on the 11th inst., on transferring command of Second Cruiser Squadron to Rear-Admiral Sturdee.

The armoured cruiser "Antrim" completed to full crew at Sheerness on 3rd inst. for service in Third Cruiser Squadron, she has been fitted for service as a flagship, and Rear-Admiral Madden hoisted his flag on board her on the 11th inst., on assuming command of the Third Cruiser Squadron.

The third-class cruiser "Pegasus" arrived at Plymouth on the 25th ult. from Australia, and proceeded to Chatham, where she paid off on the 9th inst., recommissioning the following day for a further term of service on the Cape of Good Hope station, where she will relieve the "Pandora."

The 3rd Battle Squadron of First Fleet, consisting of the "King Edward VII." (flagship of Vice-Admiral Cecil Burney, commanding), "Hibernia" (flagship of Rear-Admiral Cecil F. Thursby, C.M.G.). "Africa," "Britannia," "Commonwealth," "Dominion," "Hindustan," "Zealandia," left for the Mediterranean on the 26th October, and arrived at Malta on the 7th ult., the first division proceeding to Besika Bay, and the second to Smyrna; both divisions left again on the 21st for Malta, where they arrived on the 24th.

A statement having appeared in the Press on the 28th ult. to the effect that a large British armoured cruiser had been sent from the China station to Muscat, on account of the projected visit there of a similar

French vessel, the Admiralty, in an official *Communiqué*, issued the next day, states that, "Nothing is known of any such movement on the part of French warships, and the 'Defence,' which is now at Colombo, is proceeding to the Mediterranean, where she will become the flagship of the Rear-Admiral Commanding the Mediterranean Cruiser Squadron; her place in the Far East is to be taken by the 'Hampshire,' now at Constantinople."

The following names have been approved for the battleships of the current year's programme:—

"Queen Elizabeth," laid down at Portsmouth Dockyard.

"Warspite," laid down at Devonport Dockyard.

"Valiant" and "Barham" are to be constructed by the Fairfield Company, Glasgow, and Messrs. John Brown, Clydebank, respectively. It is reported that the new ships are to have a displacement of 27,000 tons, with engines developing 60,000 S.H.P., giving a speed of 25 knots, and they are to mount eight 15-inch guns, with sixteen 6-inch guns in a central battery. The heavy guns will be in four turrets on the centre line, two being raised so as to fire over those in front.

The new first-class battleship "King George V." was commissioned at Portsmouth on the 16th ult., for service in the Second Battle Squadron, and the new battle cruiser "Princess Royal" was commissioned two days earlier at Devonport for service in the First Cruiser Squadron, where she takes the place of the "Inflexible." Both the "King George V." and the "Princess Royal" have completed their steam trials most satisfactorily, the first-named making easily over the 21 knots required by the Admiralty, and under natural draught, while the latter, it is stated unofficially, made over 34 knots in one of her runs. She has a displacement of 26,350 tons, and her turbine engines were designed to give a speed of 28 knots, with I.S.P. of 70,000. Her main armament consists of eight 13.5-inch guns mounted in four turrets on the centre line, with the second turret from forward raised, so that its guns can fire ahead, thus enabling four guns to be fired in this direction, and she also carries sixteen 4-inch guns for defence against torpedo-craft. The main armour belt has a thickness of nine inches tapering to four inches at the extremities, and the ship has a maximum storage capacity for 3,500 tons of coal, and about 500 tons of oil fuel.

The new battle-cruiser "New Zealand" was commissioned on the 19th ult., at Devonport. She is almost identical with the "Indefatigable," her dimensions being as follows:—Length over all, 580 feet, at water-line, 578 feet; beam, 79.5 feet, with a mean draught of 27 feet 9 inches. Her armament consists of eight 50-calibre 12-inch guns in pairs in turrets, one forward, one aft, and two diagonally amidships, with sixteen 50-calibre 4-inch guns in superstructure, two submerged 21-inch torpedo-tubes on the broadside, and one astern. Her armour protection consists of a complete belt about 14 feet wide, 8 inches thick amidships, tapering to 4 inches at the extremities, with 10 inches on the turrets, 6 inches on the turret bases, 10 inches on the conning tower, and a 3-inch deck. Her turbine engines developed 47,135, I.S.P., which gave a speed on her trials of 26.5 knots.

THE DREADNOUGHT GIFT FROM THE MALAY STATES.—The following resolution was passed by the Federal Council on the 12th ult:—

"With a view to the strengthening of the British Empire and maintaining her naval supremacy, the rulers and the people of the Federated Malay States desire to offer to his Majesty's Government a first-class armoured ship, and it is resolved that this offer should be made, the vessel to be constructed as soon as his Majesty's advisers consider desirable, details as to payment to be decided hereafter, but payment to be within five years if possible." All the rulers and unofficial members spoke in its favour.

CANADA.

MEMORANDUM ON NAVAL DEFENCE REQUIREMENTS.

PREPARED BY THE ADMIRALTY FOR THE GOVERNMENT OF CANADA

The following document, prepared by the Admiralty, on the instructions of His Majesty's Government, in compliance with the request of Mr. Borden, was laid before the Dominion Parliament:—

"1. The Prime Minister of the Dominion of Canada has invited His Majesty's Government through the Board of Admiralty to prepare a statement of the present and immediately prospective requirements of the naval defence of the Empire for presentation to the Canadian Parliament if the Dominion Cabinet deem it necessary.

The Lords Commissioners of the Admiralty are prepared to comply and to supplement, in a form which can be made public, the confidential communications and conversations which have passed between the Admiralty and Ministers of the Dominion Parliament during their recent visit to the United Kingdom.

The Admiralty set the greatest store by the important material, and still more important moral, assistance which it is within the power of Canada to give to maintaining British naval supremacy upon the high seas, but they think it necessary to disclaim any intention, however indirect, of putting pressure upon Canadian public opinion, or of seeking to influence the Dominion Parliament in a decision which clearly belongs solely to Canada.

The Admiralty therefore confine themselves in this statement exclusively to facts, and it is for the Dominion Government and Parliament to draw their own conclusions therefrom.

2. The power of the British Empire to maintain the superiority on the sea which is essential to its security must obviously be measured from time to time by reference to the other naval forces of the world, and such a comparison does not imply anything unfriendly in intention or in spirit to any other Power or group of Powers. From this point of view the development of the German Fleet during the last fifteen years is the most striking feature of the naval situation to-day. That development has been authorized by five successive legislative enactments, viz., the Fleet Laws of 1898, 1900, 1906, 1908, and 1912. These laws cover the period up to 1920.

Whereas in 1898 the German Fleet consisted of:—

Nine battleships (excluding coast defence vessels), three large cruisers. 28 small cruisers, 113 torpedo-boats, and 25,000 men, maintained at an annual cost of £6,000,000; the full Fleet of 1920 will consist of:—

Forty-one battleships, 20 large cruisers, 40 small cruisers, 144 torpedo-boats, 72 submarines, and 101,500 men,

estimated to be maintained at an annual cost of £13,000,000. These figures, however, give no real idea of the advance, for the size and cost of ships has risen continually during the period, and, apart from increasing their total numbers, Germany has systematically replaced old and small ships, which counted as units in her earlier Fleet, by the most powerful and costly modern vessels. Neither does the money provided by the Estimates for the completed law represent the increase in cost properly attributable to the German Navy, for many charges borne on British naval funds are otherwise defrayed in Germany; and the German Navy comprises such a large proportion of new ships that the cost of maintenance and repair is considerably less than in navies which have been longer established.

3. The naval expansion of Germany has not been provoked by British naval increases. The German Government have repeatedly declared that their naval policy has not been influenced by British action, and the following figures speak for themselves:—

In 1905 Great Britain was building four capital ships, and Germany two.

In 1906 Great Britain reduced to three capital ships, and Germany increased to three.

In 1907 Great Britain built three capital ships, and Germany built three.

In 1908 Great Britain further reduced to two capital ships, and Germany further increased to four.

It was not until the efforts of Great Britain to procure the abatement or retardation of naval rivalry had failed for three successive years that the Admiralty were forced in 1909, upon a general review of the naval situation, to ask Parliament to take exceptional measures to secure against all possible hazards the safety of the Empire. In that year, eight capital ships were laid down in Great Britain, and two others were provided by the Commonwealth of Australia and the Dominion of New Zealand respectively —a total of ten.

4. In the spring of the present year the fifth German Navy Law was assented to by the Reichstag. The main feature of that law is not the increase in the new construction of capital ships, though that is important, but rather the increase in the striking force of ships of all classes which will be immediately available at all seasons of the year.

A third squadron of eight battleships will be created and maintained in full commission as part of the active battle fleet. Whereas, according to the unamended law, the active battle fleet consisted of 17 battleships, four battle or large armoured cruisers and 12 small cruisers, it will in the near future consist of 25 battleships, eight battle or large armoured cruisers, and 18 small cruisers; and whereas at present, owing to the system of recruitment which prevails in Germany, the German Fleet is less fully mobile during the winter than during the summer months, it will, through the operation of this law, not only be increased in strength, but rendered much more readily available. Ninety-nine torpedo-boat destroyers, instead of 66, will be maintained in full commission out of a total of 144; 72 new submarines will be built within the currency of the new law, and of these it is apparently proposed to maintain 54 with full permanent crews. Taking a general view, the effect of the law will be that nearly four-fifths of the entire German Navy will be maintained in full permanent commission; that is to say, instantly and constantly ready for war.

So great a change and development in the German Fleet involves, of course, important additions to their personnel. In 1898 the officers and men of the German Navy amounted to 25,000. To-day that figure has reached 66,000. The new law adds 15,000 officers and men, and makes a total in 1920 of 101,500.

The new construction under the law prescribes the building of three additional battleships—one to be begun next year, one in 1916—and two small cruisers, of which the date has not yet been fixed. The date of the third battleship has not been fixed. It has been presumed to be later than the six years which are in view. The cost of these increases in men and in material during the next six years is estimated as £10,500,000, spread over that period above the previous estimates.

The facts set forth above were laid before the House of Commons on the 22nd July, 1912, by the First Lord of the Admiralty.

5. The effect of the new German Navy Law is to produce a remarkable expansion of strength and readiness. The number of battleships and large armoured cruisers which will be kept constantly ready and in full commission will be raised by the law from 21, the present figure, to 33—an addition of 12, or an increase of about 57 per cent.

The new fleet will, in the beginning, include about 20 battleships and large cruisers of the older type, but gradually as new vessels are built the fighting power of the fleet will rise until in the end it will consist completely of modern vessels.

The complete organization of the German Fleet, as described by the latest law, will be five battle squadrons and a fleet flagship, comprising 41 battleships in all, each attended by a battle or armoured cruiser squadron, complete with small cruiser and auxiliaries of all kinds and accompanied by numerous flotillas of destroyers and submarines.

This full development will only be realized step by step; but already in 1914 two squadrons will, according to Admiralty information, be entirely composed of what are called "Dreadnoughts," and the third will be made up of good ships like the "Deutschlands" and the "Braunschweigs," together with five "Dreadnought" battle cruisers.

This great fleet is not dispersed all over the world for duties of commerce protection or in discharge of Colonial responsibilties; nor are its composition and character adapted to those purposes. It is concentrated and kept concentrated in close proximity to the German and British coasts.

Attention must be drawn to the explicit declaration of the tactical objects for which the German Fleet exists as set forth in the preamble to the Naval Law of 1900 as follows:—

"In order to protect German trade and commerce under existing conditions, only one thing will suffice, namely, Germany must possess a battle fleet of such a strength that even for the most powerful naval adversary a war would involve such risks as to make that Power's own supremacy doubtful. For this purpose it is not absolutely necessary that the German Fleet should be as strong as that of the greatest naval Power, for, as a rule, a great naval Power, will not be in a position to concentrate all its forces against us."

6. It is now necessary to look forward to the situation in 1915.

IN HOME WATERS.

In the spring of the year 1915—

Great Britain will have 25 "Dreadnought" battleships and two "Lord Nelsons."

Germany will have 17 "Dreadnought" battleships."

Great Britain will have six battle-cruisers.

Germany will have six battle-cruisers.

These margins in new ships are sober and moderate. They do not err on the side of excess. The reason they suffice for the present is that Great Britain possesses a good superiority in battleships, and especially armoured cruisers, of the pre-"Dreadnought" era.

The reserve of strength will steadily diminish every year, actually because the ships of which it is composed grow old, and relatively because the new ships are more powerful. It will diminish more rapidly if new construction in Germany is increased or accelerated. As this process continues, greater exertions will be required by the British Empire.

MEDITERRANEAN STATION.

Four battle-cruisers and four armoured cruisers will be required to support British interests in the Mediterranean during the years 1913 and 1914. During those years the navies of Austria and Italy will gradually increase in strength, until in 1915 they will each possess a formidable fleet of four and six "Dreadnought" battleships respectively, together with strong battleships of the pre-"Dreadnought" types and other units, such as cruisers, torpedo-craft, &c. It is evident, therefore, that in the year 1915 our squadron of four battle-cruisers and four armoured cruisers will not suffice to fulfil our requirements, and its whole composition must be reconsidered.

OVERSEA.

It has been necessary within the past decade to concentrate the fleet mainly in Home waters.

In 1902 there were 160 British vessels on the oversea stations against 76 to-day.

7. Naval supremacy is of two kinds: general and local. General naval supremacy consists in the power to defeat in battle and drive from the seas the strongest hostile navy or combination of hostile navies wherever they may be found. Local superiority consists in the power to send in good time to, or maintain permanently in, some distant theatre forces adequate to defeat the enemy or hold him in check until the main decision has been obtained in the decisive theatre. It is the general naval supremacy of Great Britain which is the primary safeguard of the security and interests of the great Dominions of the Crown, and which for all these years has been the deterrent upon any possible designs prejudicial to or inconsiderate of their policy and safety.

The rapid expansion of Canadian sea-borne trade, and the immense value of Canadian cargoes always afloat in British and Canadian bottoms, here require consideration. On the basis of the figures supplied by the Board of Trade to the Imperial Conference of 1911, the annual value of the overseas trade of the Dominion of Canada in 1909-10 was not less than £72,000,000, and the tonnage of Canadian vessels was 718,000, and these proportions have already increased and are still increasing.

For the whole of this trade wherever it may be about the distant waters of the world, as well as for the maintenance of her communications, both with Europe and Asia, Canada is dependent, and has always depended, upon the Imperial Navy, without corresponding contribution or cost.

Further, at the present time and in the immediate future Great Britain still has the power, by making special arrangements and mobilizing a portion of the reserves, to send, without courting disaster at home, an effective fleet of battleships and cruisers to unite with the Royal Australian Navy and the British squadrons in China and the Pacific for the defence of British Columbia, Australia and New Zealand. And these communities are also protected and their interests safeguarded by the power and authority of Great Britain so long as her naval strength is unbroken.

8. This power, both specific and general, will be diminished with the growth not only of the German Navy, but by the simultaneous building by many Powers of great modern ships of war.

Whereas, in the present year, Great Britain possesses 18 battleships and battle-cruisers of the "Dreadnought" class against 19 of that class possessed by the other Powers of Europe, and will possess in 1913, 24 to 21, the figures in 1914 will be 31 to 33; and in the year 1915, 35 to 51.

The existence of a number of navies all comprising ships of high quality must be considered in so far as it affects the possibilities of adverse combinations being suddenly formed. Larger margins of superiority at Home would, among other things, restore a greater freedom to the movements of the British squadrons in every sea, and directly promote the security of the Dominions. Anything which increases our margin in the newest ships diminishes the strain, and augments our security and our chances of being left unmolested.

9. Whatever may be the decision of Canada at the present juncture, Great Britain will not in any circumstances fail in her duty to the Oversea Dominions of the Crown.

She has before now successfully made head alone and unaided against the most formidable combinations and she has not lost her capacity, by a wise policy and strenuous exertions, to watch over and preserve the vital interests of the Empire.

The Admiralty are assured that His Majesty's Government will not hesitate to ask the House of Commons for whatever provision the circumstances of each year may require. But the aid which Canada could give at the present time is not to be measured only in ships or money. Any action on the part of Canada to increase the power and mobility of the Imperial Navy, and thus widen the margin of our common safety, would be recognized everywhere as a most significant witness to the united strength of the Empire, and to the renewed resolve of the Oversea Dominions to take their part in maintaining its integrity.

10. The Prime Minister of the Dominion having enquired in what form any immediate aid that Canada might give would be most effective, we have no hesitation in answering, after a prolonged consideration of all the circumstances, that it is desirable that such aid should include the provision of a certain number of the largest and strongest ships of war which science can build or money supply."

As the result of the communications which have been passed between the Home Authorities and the Dominion Government, Canada has offered to provide three battleships towards the defence of the Empire.

FRANCE.

The following are the principal appointments which have been made :—

Vice-Admirals—J. Bellue to be Commander-in-Chief of 5th Arrondissement Maritime (Toulon); L. V. Marin-Darbel to be Commander-in-Chief of Third Squadron; L. R. G. de Marolles to be Commander-in-Chief of Second Squadron. Rear-Admirals—M. G. de Ramey de Sugny to command of 2nd Division of Third Squadron; P. J. Darrieus to be Commandant du Front de Mer at Toulon; A. Guillou to be a member of the Superior Commission of the Invalides de la Marine. Capitaine de Vaisseau—P. O. Bernard to "Masséna." Capitaines de Frégate—L. G. Mangematin to "Bourrasque"; P. Y. Méléart to "Pique"; L. M. Le Vay to "Escopette"; L. J. Faucon to "Typhon," and command of Cherbourg Torpedo Flotilla; E. M. Perdriel to "Siroco," and command of Brest Torpedo and Submarine Flotillas; H. T. de Cacqueray to "Francisque," and command of 1st Submarine Flotilla of the Second Cruiser Squadron; Guy MacGuckin de Slane to command of Submarine Flotilla at Toulon.

Launch.—The new first-class battleship "France" was launched on the 7th ult. from the Ateliers et Chantiers de la Loire at Saint Nazaire. She is the fourth ship of the "Dreadnought" type for the French Navy to take the water, and is a sister ship to the "Paris," details of which have already been given in the Journal, but it may be convenient to repeat them. Her dimensions are as follows:—Length, 541.3 feet; beam, 88.6 feet; draft (max.), 29.5 feet, with a displacement of 23,096 tons. The engines are to develop 28,605 I.H.P., giving a speed of 20 knots; they are of the Parsons turbines type, with four screws.

Protection is afforded by a complete belt of Krupp steel, 16.1 feet wide (7.9 feet above water); 10.6 inches amidships, 7.1 inches at ends; turrets, 11.8 inches, with 11-inch barbettes; battery and main deck side amidships, 7.1 inches; conning tower, 11.8 inches; deck, flat below belt, 2.7 inches; upper deck, 1.9 inch; funnel bases, etc., 7.1 inches.

The armament consists of twelve 12-inch (50 calibre) guns, in pairs in turrets, two forward, two aft, one on each beam, No. 2 firing over No. 1, and No. 5 over No. 6; twenty-two 5.5-inch (50 calibre) Q.F. guns, and four 3-pdrs., with four 18-inch submerged torpedo tubes on the broadside. The ship will have a complement of 941 officers and men.

La Vie Maritime.

Steam Trials.—The official trials of the new destroyers "Fourche" and "Faux" have been carried out satisfactorily, the results being as follows :—

"Fourche."—Full speed trial for six hours:—mean pressure at boilers, 16 kg.; mean pressure at admission, 12 kg.; air pressure in stokeholds, 180 mm. of water; pressure of mazout at the furnaces, 13 kg.; revolutions per minute, 680; mean speed for six hours, 33.20 knots; best run on measured mile, 33.60; mean speed according to contract, 31 knots; coal consumption per hour, 10 tons 400 kg.; according to contract, 12 tons 500 kg.; coal consumption per square metre of grate surface, 5.47 kg.; according to contract 6.50 kg. per B.H.P.; miles per ton of mazout, 3.19; grate surface per B.H.P., 0.104; condenser surface per B.H.P., 0.03. State of sea, smooth.

Eight hours' coal consumption trial:—Boilers under pressure, 2; mean pressure at boilers, 16 kg.; mean pressure at admission, 8 kg.; air pres-

sure in stokeholds, 25 mm. of water; pressure of mazout at furnaces, 8 kg.; mean No. of revolutions, 242; mean speed, 14 knots; coal consumption, 910 kg.; No. of miles per ton of mazout consumed, 15.38.

"FAUX."—Six hours' full speed trial:—Displacement before trial, 722 tons; mean draft of water, 2.52 m.; mean pressure at boilers, 16 kg.; mean pressure at admission, 12 kg.; air pressure in stokeholds, 180 mm. of water; pressure of mazout at furnaces, 13.500 kg.; revolutions per minute, 653; mean speed for six hours, 32,01 knots; best run on measured mile, 34.9 knots; mean speed according to contract, 31 knots; coal consumption per hour, 10 tons 20 kg.; according to contract, 12 tons 50 kg.; coal consumption per square metre of grate surface, 5.30 kg.; according to contract, 6.50 kg. per B.H.P.; miles per ton of mazout, 3.13; grate surface per B.H.P., 0.104; condenser surface per B.H.P., 0.03. State of the sea, rough.

Eight hours' coal consumption trial:—Boilers without pressure, 2; mean pressure at boilers, 16 kg.; mean pressure at admission, 8 kg.; air pressure in stokeholds, 25 mm.; pressure of mazout at furnaces, 8 kg.; mean No. of revolutions, 242; mean speed, 14 knots; coal consumption per hour, 925 kg.; No. of miles per ton of mazout consumed, 15.14. For these official trials the bottom of the "Faux" had not been cleaned.

THE GUN ACCIDENT ON BOARD THE "JULES MICHELET," AND FRENCH POWDERS.—It may be recalled that last summer during gunnery practice a serious accident in the shape of two flarebacks from 6-inch guns occurred on board the armoured cruiser "Jules Michelet," which resulted in the death of four men and in several others being injured. These accidents were generally attributed in the fleet to the powder being bad, although this was denied by the manufacturers. A lively campaign has since been, and is still being, carried on, according to *La Vie Maritime*, against this B powder, as it is termed, but up to the present it does not appear that a new powder has been adopted by the French authorities, although experiments with certain foreign powders have been made.

This B powder, according to the *Journal of the United States Naval Institute Proceedings*, is composed of two kinds of nitro-cellulose, soluble and insoluble, of 11.60 and 13.23 per cent. nitration, respectively. Until a comparatively recent period amyl alcohol was the solvent, but it has been given up, in spite of the claim that has always been made that it doubled the life of the powder, for ethyl alcohol, and dyphenylamine is used as a stabiliser.

The nitro-cellulose is manufactured at one factory, and the powder at another. The required stability test of nitro-cellulose with potassium iodide starch paper at 65.5° C. is but 20 minutes, which seems hardly to be long enough, as a faulty purification could easily give this.

The powder is made in ribbon form, and the variation in its ballistic qualities is made by variation in the percentages of the soluble and insoluble nitro-cellulose in its composition, and not by varying the web thickness. The stability of any nitro-cellulose powder is absolutely dependent on the quality of the raw materials and on the thoroughness with which the details and purification processes are carried out step by step in its manufacture. The French process of drying is complicated, and includes water drying, which was abandoned, after experimentation, in the United States as injurious to the stability of the material.

General Gaudin, who is president of the Court of Inquiry, called together to investigate the causes of these accidents, has made his first report to M. Delcassé, from which it would appear that:—

1. The accident cannot be assigned to spontaneous ignition of the powder resulting from decomposition thereof. The powder is essentially one of high stability.

2. The ignition of the charge was not due to the high temperature of the powder chamber walls.

3. The place to look for the trouble is (*a*) in the solid residue of combustion, (*b*) in the inflammable gas produced by the combustion of the charge for the previous shot, which gas may not have been entirely driven out of the bore, (*c*) in the volatile matter given off normally by the powder and carried by the charges themselves under certain conditions.

The *Moniteur de la Flotte* in its comment says that the last theory is the only possible one. Let us assume that amyl alcohol emits an inflammable gas. There will be, in this event, two compounds, nitrite of ammonium, which explodes at 50°, and nitrite of amyl, susceptible of starting the fire at a low temperature in contact with water or air of high humidity. The serge of the cartridge bag was perhaps thoroughly soaked with volatile matter, and we see the probability of using in place of serge, a fusible metallic case proof against the amyl and ammonium nitrites.

It is perhaps worthy of remark that the powders designated for shore use have only two to three per cent. of amyl alcohol in place of the eight per cent., which probably accounts for the few accidents with powder in the war department.

HOLLAND.

SHIPPING.—The Phœnix Shipping Company of Berlin and Rotterdam is going to inaugurate an emigrant passenger service from Rotterdam to New York. Six steamers will be employed, and will commence sailing shortly.

The Indian Lloyd is suspending its sailings between Rotterdam and Bombay and making over its existing contracts to the (German) Hanva Company.

WIRELESS TELEGRAPHY.—The Marconi Company have received orders for the installation of wireless plant on 37 Dutch merchant vessels.

SHIPBUILDING.—During 1911 vessels aggregating 223,180 tons were built in Dutch yards. This included six ships of over 5,000 tons. The Dutch yards were unable to carry out all the orders given to them.

ITALY.

A grand review of the fleet was held by the King on the 11th ult., the forty-fourth anniversary of His Majesty's birthday. The fleet was composed as follows:—

Fleet flagship—First-class battleship "Dante Alighieri."

1ST SQUADRON.

Vice-Admiral Viale, commanding.

1st Division.

Battleships—"Vittorio Emanuele" (flagship of Rear-Admiral Corsi), "Regina Elena," "Roma," "Napoli."

2nd Division.

Armoured cruisers—" Pisa " (flagship of Rear-Admiral Cito-Filomarino), " Amalfi," " San Giorgio," " San Marco."

Scouts—" Quarto," " Agordat," and three destroyers.

2ND SQUADRON.

Vice-Admiral Amero d'Aste.

1st Division.

Battleships—" Regina Margherita " (flagship of Vice-Admiral d'Aste), " Benedetto Brin," " Ammiraglio di St. Bon," " Emanuele Filiberto."

2nd Division.

Armoured Cruisers—" Garibaldi " (flagship of Rear-Admiral Patris), " Varese," " Francesco Ferruccio."

Scouts—" Piemonte," " Coatit," and eight destroyers.

Training Ships Division.

Battleships—" Re Umberto " (flagship of Rear-Admiral Cerri), " Sardegna," " Sicilia."

Torpedo-Division.

Armoured Cruiser—" Vettor Pisani " (flagship of Rear-Admiral Thaon di Revel).

Cruiser—" Lombardia," with nine destroyers, 28 sea-going torpedo-boats and 15 submarines.

STEAM TRIAL.—The new battleship " Dante Alighieri " has completed her steam trials successfully; on her full-speed trial the engines (turbines) developed 26,000 I.S.P., giving a speed of 24 knots. Her turbines of the Parsons type worked perfectly without any strain.

REPORT OF THE MINISTRY OF MARINE.—The official report of the Minister of Marine replies to Parliamentary criticism as follows:—

The purchase of armour plate from abroad was criticized and the Minister stated that from henceforth the home industry would be supported and armour plate of the French Marrel system will be produced in Italy for the Navy.

In regard to the inferiority of the 12-inch guns to that of the Krupp guns of the same calibre, the Minister recommends that the 14.2-inch guns shall be introduced for the super-" Dreadnoughts."

The Minister also stated that it was intended to build an offensive type of submarines of 1,000 tons displacement, and he complained of the lack of a mother ship for submarines, which is generally provided in other navies.

Notwithstanding the efficiency of the torpedo-destroyers during the war, these vessels are not yet considered satisfactory. Greater speed, greater displacement and heavier armaments are shown to be needed. The expenditure incurred in providing small torpedo-boats designated for purely local service did not pay, as the small displacement of these vessels limited their use in service.

The report recommends strongly the adoption of a combined system of turbines and reciprocating engines; the turbine plant to be used for maximum speed and the reciprocating engines for economical cruising; and it further states that efforts will be made to reduce the building period required for battleships, and recommends the construction of special

vessels for the conveyance of oil fuel, as well as the provision of a coast flotilla to prevent smuggling.

The war has shown that the Italian Mercantile Marine is not in a satisfactory condition. There is no apparent hope for any marked improvement in this respect.

In 1911 there were 49 steamers which made their first trips under the Italian flag. Of these only eight were built in Italian yards, viz., one cargo boat of 5,600 tons, six steamers of 4,000—1,650 tons, and a small ship of 500 tons. The Italian Marine has not made satisfactory progress and the report that the "Navigazione Generale Italiana" intended to build two steamers of 20,000 tons displacement and 18 knots speed has unfortunately not been confirmed.

This condition of things continues, notwithstanding the fact that in 1911 steamship companies throughout the world did a profitable business. The Hamburg-American Line paid a dividend of nine per cent., and other companies as much as 12 and 15 per cent.

Two measures are advocated as necessary to revive the Italian Merchant Marine:—

1.—Support by credit in the Naval Budget in order that capital may be invested in the Mercantile Marine with greater security.

2.—To provide that all the coal for the Italian Navy shall be carried exclusively by vessels flying the Italian flag. Nine million tons of coal are annually required for the Italian Navy and the freight on this would stimulate Italian shipping.

In regard to the strength of the personnel of the Italian Navy, the report states that on December 31st, 1911, there was a total of 35,753, of whom 5,830 were called out for war mobilization, leaving 29,923 in active service, of whom 21,305 served afloat and 8,618 on shore. The number of mobilized men called out for war and serving afloat was 4,281.

Précis from the *Mitteilungen aus dem Gebiete des Seewesens.*

NORWAY.

NAVAL AND COAST DEFENCE.—The Government has laid before the Storthing certain proposals for naval expansion and extraordinary expenditure on defence. In a preamble, the Minister of Defence states that the naval power of Norway must be resuscitated in order to preserve the neutrality of the country in the event of war between the Great Powers in the North Sea. The fleet is to be brought as soon as possible up to the strength recommended by the Committee of Defence in 1910, viz.: Eight armoured coast defence vessels, six scouts, forty torpedo boats, twelve submarines, four large gunboats, and one mine-layer. Extraordinary expenditure is now proposed on the following:—

Two armoured vessels	£883,000
Fortified naval station in the Ofoten Fjord (in addition to £52,000 already voted)	£50,000
Ammunition for the fleet and fortress artillery ...	£33,000
Total ...	£966,000

The funds available will furnish £33,000, and it is proposed to furnish the remainder by loan.

RUSSIA.

TORPEDO RANGE NEAR THEODOSIA.—The Lessner Company have acquired land at Druyakornaya Bay, near Theodosia, for the establishment of a practice range for Whitehead and other torpedos.

BOUNTIES FOR SHIPBUILDING.—The new law granting bounties to shipbuilding firms in Russia for vessels built for service abroad comes into force on 14th January, 1913, and will have effect for 15 years.

A TROPHY OF 1854.—The British Naval Attaché has formally handed over to the Russian authorities at Archangel a bell taken in 1854 from the Solovetski Monastery, and until recently in use in Portsmouth Dockyard Chapel.

SERVIA.

NEW PORT ON THE DANUBE.—Early this year a Russian engineer was given the contract for a new port on the Danube at Radujevac, opposite to Gruia on the Rumanian bank. The harbour will be deep enough for small sea-going vessels. This port will be the point of departure for the projected trans-Balkan—Danube—Adriatic railway, which is now in course of projection.

UNITED STATES.

PEARL HARBOUR, HAWAIIAN ISLANDS.—Plans for the extension of the naval dry dock at Pearl Harbour are completed, and $1,050,000 have been authorized for the continuation of the work, which will include an increase in length of the dock from 800 to 1,000 feet.

AMMUNITION CONTRACTS.—The Navy Department recently asked for bids for 2,000 14-inch armour piercing shells. The Hadfield Steel Foundry, Sheffield, offered to supply them at £79 per shell, but the closest approach to this in the United States was the tender by the Washington Steel and Ordnance Company, which bid £98 per shell. Similarly, bids for 3,500 12-inch shells showed a difference of £37 8s. and £54 8s. in favour of the British Company. The six leading steel works in the United States then held a meeting, and informed the Navy Department that the United States foundries would no longer keep up the equipment for making shells unless the order was given to American firms. The Navy Department has been consequently forced to place the contract in the United States.

MILITARY NOTES.

BRITISH EMPIRE.

STRENGTH OF THE TERRITORIAL FORCE.

The following figures were given in a Parliamentary Paper (Cd. 6505) in November:—

The strength of the Territorial Force on October 1st, 1912, was 9,236 officers, and 252,152 non-commissioned officers and men. The number who were present in camp in 1912 for 15 days and over were 6,855 officers and 154,995 non-commissioned officers and men.[1] The

[1] Of this total of 161,850, 92,213 were infantry.

number who were present in camp for eight days and less than 15 was 1,014 officers and 66,366 men. Those present for less than eight days numbered 47 officers and 314 non-commissioned officers and men. The total number who failed to attend camp was 1,362 officers and 33,350 non-commissioned officers and men; of whom 1,325 officers and 27,331 non-commissioned officers and men were absent with leave, and 37 officers and 6,019 non-commissioned officers and men without leave. With regard to 41 officers and 6,755 non-commissioned officers and men who were absent without leave from camp in 1911, disciplinary action was taken in the case of 20 officers. Of these officers 16 resigned, one was reported to his general officer commanding, and action was still being taken in the case of the remaining three. Disciplinary action was taken against 2,490 of other ranks. The number whose engagements expired between October 1st, 1911, and September 30th, 1912, was 80,403, and 39,681 re-engaged during this period.

For the year ended September 30th, 1909, 110,020 recruits joined; for the year ended September 30, 1910, 42,239 recruits joined; for the year ended September 30th, 1911, 39,086 recruits joined; and for the year ended September 30th, 1912, 57,946 recruits joined. The number of non-commissioned officers and men under 19 on October 1st, 1912, was 40,684. In the musketry year 1910-11, from the Yeomanry, Field Companies, Royal Engineers, and Infantry, 52,590 recruits were tested in musketry; 31,976 qualified, and 20,614 failed. The trained men tested were 125,322, and of these 111,432 qualified and 13,890 failed. All the men referred to as having qualified passed the standard test. In addition to the number given above as having qualified 17,932 recruits and trained men qualified in musketry by attendance at classification 30 yards, or miniature ranges. Thirty-four battalions of infantry carried out battalion field firing. The number of battalions in which all companies had been exercised in company field firing was 92. There were 62 battalions in which some, but not all, companies had been exercised in company field firing, and there were 53 battalions in which no company field firing was performed. There were 20,817 horses in camp with the Yeomanry. Of these, 8,034 were the property of officers, non-commissioned officers, and men, 12,761 were hired, 14 were the property of the Government, and eight were the property of County Associations. Some of the hired horses were present at more than one training. One hundred and thirty-one batteries carried out annual practice in 1912, and in addition the 11 batteries of the 1st London Divisional Artillery fired a modified course at Shoeburyness during the summer on Saturday afternoons. This represented 78 per cent. of the total number of horse and field batteries, not counting the aforesaid 11 batteries. Of the horse and field batteries that went to camp, 102 took their full complement of horses. The average deficiency in the remaining 29 batteries was 11 horses, but almost all had sufficient for the personnel attending camp.

The actual cost of the Territorial Force for the year ended March 31st, 1912, could not be given, but it was estimated at £3,200,000. During the period from October 1st, 1911, to September 30th, 1912, 1,364 officers were appointed to the Territorial Force, including the Unattached List, and 1,184 resigned. The strength of the Territorial Force Reserve on October 1st, 1912, was, according to the Army List, 313 officers and 865 men. The increase of non-commissioned officers and

men in the Reserve during the year had been 375, and this was roughly the number who had joined from the Territorial Force during the period.

As to the average number of drills, exclusive of camp, performed by the men of the Artillery, the Yeomanry, and the Infantry of the Force, the following were the figures for the year ended October 31st, 1911: Yeomanry—officers 11.92; other ranks, 16.58; by the Artillery—officers, 24.96; other ranks, 22.72; by the Infantry—officers, 18.19; other ranks, 18.35. The average number of week-ends spent in camp (extra training) by the Yeomanry was—officers, .12; other ranks, .98; by the Artillery—officers, .57; other ranks, .24; by the Infantry—officers, .48; other ranks, .22.

The number of qualified signallers in the Territorial Force in 1911 was as follows:—257 officers (instructors), 428 assistant instructors, and 1,444 qualified signallers.

The numbers in the previous year were as follows:—234 officers (instructors), 417 assistant instructors, and 2,635 qualified signallers. No figures for the year 1912 are yet available. It is to be observed that the examination has been made more severe, and this accounts for the large drop in the number of qualified signallers.

Afghanistan.

RAILWAYS.—A remarkable article on railways in Afghanistan has recently appeared in the *Siraj-ul-Akbar Afghania*, a newspaper published at Kabul and an "official organ."

The article shows the value of railways for personal comfort, benefit to trade, and for defence. The disadvantages are also pointed out, namely, that any linking of Afghan lines with Indian or Russian Central Asian lines would menace the safety and integrity of Afghanistan. The conclusion indicated is that Afghanistan needs railways, but that they should be internal railways only.

India.

THE ABOR EXPEDITION.—The King has been pleased to command that the "India General Service Medal, 1908," in silver, with clasp, "Abor, 1911-12," shall be granted to all troops who took part in the expedition, and served, under the orders of Major-General H. Bower, C.B., commanding the forces, at or beyond Kobo, between October 6th, 1911, and April 20th, 1912, both dates inclusive. Officers and men already in possession of the "India General Service Medal, 1908," will receive the clasp only.

MUHAMMADAN FEELING.—The keenest interest is being evinced by Muhammadans throughout India in the war in the Balkans. Large subscriptions for the relief of Turkish sufferers have been collected.

It is reported in the Press that Pathan Mullas are preaching in rural Sind the gospel of the spiritual lordship of the Amir of Afghanistan over all the Islamic peoples of the world, a position which has been filled heretofore by the Turkish Sultans.

CHINESE SOLDIERS FROM TIBET.—The last batch of Chinese soldiers for repatriation has reached India from Tibet.

It is reported that fighting still continues between Tibetans and the body of Chinese troops (some 200) left at Lhasa.

AUSTRIA-HUNGARY.

MILITARY.—The "Common" Army Budget has been submitted to the Delegations in Buda-Pest, and amounts to £20,055,046, an increase of £2,462,499, as compared with that of 1912. Among other causes of the increased expenditure are:—

(*a*) The rise in prices of almost all commodities.

(*b*) Increase in the establishment of animals in 60 machine-gun detachments.

(*c*) Formation of a new aviation and automobile section in the War Office.

(*d*) Non-recurrent expenditure caused by the passing of the new Army Bill.

(*e*) New guns for fortresses.

(*f*) Development of telegraph and wireless services.

(*g*) Provision of automobiles, motor-balloons and flying machines.

(*h*) Expenditure on fortifications.

BELGIUM.

ARMY ESTIMATES.—The Army Estimates for 1913 amount to £2,790,550, an increase of £71,500 on those for the current year. The increase may be accounted for by the increase in officers' pay, by the larger number of men to be equipped and by the dearness of food stuffs and forage.

Items of interest are:—

Improvement of military roads and the telephone systems in fortresses	£15,400
Electric installation in Meuse defences	£12,000
Searchlights in Antwerp defences	£4,000
Modifications at Liege and Namur	£4,000
Aviation park	£41,000

No provision is made for the projected reorganization of the army. The estimates generally may be regarded as of a normal peaceful nature.

NEW CHIEF OF THE GENERAL STAFF.—At the end of August the appointment of Major-General Dufour as Chief of the General Staff had not been officially ratified, although newspapers reported that the King had actually signed the necessary decree. After considerable discussion the appointment has now been definitely given to Lieut.-General De Ceunick, hitherto Chief Staff Officer at Antwerp.

RESIGNATION OF WAR MINISTER.—As a result of differences of opinion with the Premier, M. de Broqueville, over the reorganization of the army, General Michel, Minister for War, resigned, and his portfolio has been taken over by the Premier himself.

THE PROSPECT OF ARMY REORGANIZATION.—In the Prime Minister's speech at the opening of Parliament, allusion was made to the project for reorganizing and increasing the Belgian Army. No details of the scheme are as yet forthcoming. While the Liberal papers are inclined to be favourable to such a scheme, certain of the Government journals are anything but enthusiastic on the subject. It is possible that the scheme may have to undergo considerable modification to bring it into conformity with the views of the powerful Catholic "right."

CHINA.

REVIEW IN PEKING.—About 11,500 troops of all arms took part in the review held in Peking on the 10th October on the occasion of the anniversary of the Revolution. The troops on parade consisted of the Republican Guard, the Imperial Guard, gendarmerie, reserve troops, Imperial and Republican Guard Cavalry, Republican and Imperial Guard Artillery. The troops marched past in the above order, with the exception of the Imperial Guard Artillery. This latter corps, though on parade, did not march past. The appearance of the troops was good, the Republican Guard being of the best physique. The Republican Guard Artillery had on parade 12 Japanese mountain guns, and 12 Skoda 75 mm. (2.95-in.) Q.F. field guns, 1910 model.

CHINESE FINANCE.—The Ministry of Finance has sent a circular telegram to the military governors of all the provinces asking for funds to enable the Central Government to meet its liabilities. The liabilities as set forth represent a total of approximately £8,120,000, of which total £2,000,000 are required for the pay of the Army and Navy. To discharge these liabilities, due or maturing by the end of December of the present year, the Government will only have available approximately £2,600,000, which are the net proceeds in China of the Crisp loan, only £3,000,000 of which is, under the contract, payable in 1912. In the telegram it is pointed out that *likin*, customs, land and poll taxes are now being collected, whilst useless offices and unnecessary expenditure should by now have been abolished. Proper administration and regulation of finance should, therefore, provide a balance.

ARREST OF MURDERER OF MR. DAY.—Reuter's correspondent in Peking reports the arrest of the murderer of Mr. Day, the English missionary, who was killed near Pao-ting Fu in March last (see Summary of Events, China, 1912). It appears that two persons watched the man shoot Mr. Day. All three then disappeared, but the two onlookers were arrested later, and subsequently furnished a description of the supposed murderer, who was traced to Tientsin, where he had joined the police force. When the police were about to arrest him, the man again vanished, and was next discovered at Mukden. From this place he once more disappeared, but was finally caught at Kirin. The Government has employed several detectives exclusively on this case during the last eight months.

RAILWAYS.—It is stated in the *Times* of the 18th November that work has now been recommenced on the Hu-nan section of the Canton—Hankow Railway. Survey parties of foreign engineers are now at work on the line.

The same authority states that the last bolt on the Yellow River bridge of the Tientsin Pu-k'ou Railway was rivetted on the 16th November in the presence of the Governor and of the chief engineers of the British and German sections and an immense crowd of Chinese. The formal opening for through traffic is to be announced by the Minister of Posts and Communications on the 1st December.

With reference to the Belgian loan for £10,000,000 in connection with a contract for the extension of the Ho-Nan Fu—Kai-Feng Fu Railway westwards to Lan-Chou Fu and eastwards to Hai Chou, the *Times* of the 20th November states that negotiations are progressing favourably. The survey of the line from Ho-Nan Fu to Lan-Chou Fu has now begun.

China undertakes to purchase the sections of the line already built by private enterprise, one near Ching-chiang-p'u in Chiang-su, and the

other from Ho-nan Fu westwards, approximately ten miles in length. The Belgians intend to provide half the capital, while the banks constituting the French interests in the Six Powers Group are arranging to take up the remainder.

SITUATION IN EASTERN TIBET.—The situation on the Ssu-ch'uan—Tibet border is still very obscure. The correspondent of the London *Times* in Shanghai reports that the Chinese General Chu with 2,000 troops has succeeded in reaching Li-Tang, while at Ba-tang, the Chinese garrison is holding its own. It is said that a Tibetan force is meditating a descent on Ho-k'ou (where there is a ford over the Ya-Lung river), with a view to cutting the Chinese communications between Li-Tang and Ta-Chien-Lu.

The extent and name of the new province in Western Ssu-ch'uan and Eastern Tibet have been officially proclaimed. It stretches from Wa-tzu-k'ou, 15 miles east of Ta-chien-lu to Chiamdo on the right bank of the Mekong. North and south its boundaries have not yet been defined. Its name is Hsi-kang-sheng, its capital Batang, now to be called Pa-an Fu.

It is reported in the Press that a Presidential order issued in Pekin restores to the Dalai Lama his former title, *viz.*:—Sincere and Loyal Propagator of Civilization, Great, Righteous, and Complacent Buddha of the Western Heavens.

FRANCE.

ANTI-MILITARISM.—Nineteen members of the society known as "Sou du Soldat" have been condemned to fines and three months' imprisonment for sending to soldiers a pamphlet holding the Army up to ridicule and counselling soldiers to rebel against discipline. The *Confédération Socialiste Anarchiste*, which met in November, advocated sabotage on mobilization as a means of averting war. The programme put forward included poisoning horses, shooting officers, destruction of railways and the burning of mobilization stores. This society is a small one and not of great account, but its proceedings have been widely advertised.

NEW UNIFORM.—The Council of Directors have decided on the future uniform for the French Army with a view to securing some measure of invisibility. A grey blue cloth is to be used for the great coat and tunic. The present kepi will be covered with a water-proof material of the same grey-blue colour. The red trousers are to remain.

A knapsack similar to the one in use in the British Army is to be adopted, which will be 7 lbs. lighter than that used at present. The accoutrements will be slung so as to avoid pressing on the lungs and heart.

French Colonies.

WIRELESS TELEGRAPHY.—£808,000 is to be spent on linking all the colonies to the Mother Country by means of wireless telegraphy.

A station is to be erected in the South of France to connect with the East, with Africa, South America and the Pacific.

The Eastern system will have the following stations: Tunis, Djibuti, Pondicherry, Cochin China, Madagascar.

Africa and South America will have the following stations: Marocco, Colomb Bechor (south of Oran), Senegal, Timbuctoo, Bangui (Central Africa), Martinique.

The Pacific establishments will be supplied as follows: Marquesas Islands, Tahiti, Noumea.

This scheme has in view chiefly commercial needs.

WEST AFRICA.—It is announced that in the middle of December the first of the six new battalions of Senegalese raised for service in North Africa will be sent to Dakar. It will have a machine-gun section and will be sent to Marocco in April, 1913.

The other five battalions will be formed in West Africa between April and August, 1913. One of these battalions will be called the 2nd Algerian Battalion and will be sent to that colony in June next. It is to be quartered at Orleansville, Tenes and Laghourt.

ALGERIA.—When conscription was introduced into Algeria the natives asked that as they were to bear the burdens of French citizens they should also share the privileges and have the vote. This has not been given to them, but as a set-off against the performance of military service, those natives who serve their time in the Army and who obtain a certificate of good conduct on leaving, cease to be subject to the jurisdiction of the special native courts and to certain obligations to which other natives are subject. These advantages are lost if the ex-soldier is sentenced to imprisonment by the ordinary courts.

The wireless telegraphy stations of Brazzaville and Loango-Pointe-Noire have been thrown open for public use. The island of Gorée has ceased to be a free port, and the same duties as are payable on the mainland now obtain.

GUINEÉ.—The province of Kinsi has been split into two separate districts:—

(*a*) District of Foulales, comprising the tribes of Koundou, Sombili, Kassaya, Bamba, and Petti.

(*b*) District of the Malinkes of N'Gabou, and of the Bambaras of Popoko.

EQUATORIAL AFRICA.—Sultan Acyl has been deposed by Colonel Largeau and has been confined in a village close to Abesher, the capital of Wadai. Until lately Acyl had been a consistent friend of the French, and was nearly given the Croix de la Légion d'Honneur last year. In the last few months he has intrigued with the enemies of France in and around Wadai. He will not be succeeded by another Sultan, but Colonel Largeau will administer the province through seven native chiefs.

Marocco.

GENERAL SITUATION.—The French are successfully continuing their work of pacification, by means of adequate fixed garrisons combined with small mobile columns. The fact that General Lyautey left Marocco for France early in the month and that he intends to remain away for at least a month is sufficient indication that matters are proceeding satisfactorily.

COLONEL MANGIN.—Two columns left Mogador on 28th October. The first consisted of one squadron, three battalions and a battery under Colonel Mangin, the second of one squadron, two battalions and a section of artillery under Commandant Cornu; both columns moved west via El M'Tougi and reached Marrakesh about November 10th. Further patrols were then undertaken between Marrakesh and the Atlas range. Some hostile "harkas" were dispersed, but little resistance was met with on the whole.

COLONEL PEIN'S COLUMN.—Colonel Pein's column of four battalions, two squadrons, one battery and four machine-gun sections has been operating successfully against a dissident "Harka" of Beni M'Tir in the Sais plains.

MARRAKESH.—Two batteries of 120 mm. guns have been constructed at Fort Guiliz, which commands Marrakesh.

TARUDANT.—It is reported that the "mehalla" of El Glawi has inflicted a severe defeat on the southern pretender, El Hiba, under the walls of Tarudant. This is said to have had a very salutary effect in the Sus district.

CASABLANCA.—General Lyautey has approved of a scheme for improving the port at Casablanca at a cost of £1,840,000. This will involve the construction of a harbour refuge with an area of 100 acres and of an inner port of 25 acres, with the necessary tugs, boats and jetties.

GERMANY.

BUDGET FOR 1913.—The estimates for 1913 amount to £152,485,140, or an increase of £14,900,000 over those for 1912.

DEATH OF I.-G. OF CAVALRY.—Lieut.-General von Windheim, Inspector-General of Cavalry, died suddenly of heart failure on November 4th. He is to be succeeded by Lieut.-General von der Marwitz, hitherto in command of the 3rd Division.

REGULATION OF MARTIAL LAW IN BAVARIA.—A Bill to regulate the application of Martial Law in Bavaria has been laid before the Landtag. Up to now Bavaria has stood in an entirely different position in this matter to the other Federated States. The present Bill is to enable the King to declare the country under Martial Law—it deals with the composition of the Courts and the penalties that may be inflicted for certain actions, at present not punishable by Civil Law.

MILITARY ESTIMATES FOR 1913.—The Military Estimates for 1913 show an increase of £2,617,000 over those of last year. Among the more important items of increase in the strength of the German Army are the following:—

Two infantry battalions (one Saxony and one Württemberg); one cavalry regiment; one foot artillery battery (Saxony); 93 machine-gun companies; one railway battalion; 11 searchlight sections; increase in establishment in field artillery and communication troops; conversion of 17 horse artillery batteries into field batteries, and of 20 horse artillery batteries of six guns into 30 of four guns.

HOLLAND.

ARMY REORGANIZATION.—According to the *Nieuwe Rotterdamsche Courant*, it is probable that a scheme for the reorganization of the active army will be presented to the Chamber before January. The object of the reorganization is to improve mobilization in the infantry; to have 3-gun fighting batteries in the field artillery, but to retain the 6-gun organization for administrative purposes; and to organize the fortress artillery in a manner more suited to the occupation of the defensive lines of Holland.

FIELD SERVICE UNIFORM.—It is stated in the Press that a division clothed in the new grey-green field service uniform is to take part in the army manœuvres next year.

ITALY.

FINANCE.—The Minister of Finance, in an interview with the correspondent of the *Finanza Italiana*, made a statement as to Italian finance, which is summarized below :—

At the end of September the Italian Treasury had :—
£2,400,000 cash in the Bank of Italy.
£3,560,000 in ordinary Treasury Bonds.
£3,280,000 deposited with banks of foreign countries.
£6,200,000 available from the advances which Italian Banks of Issue may be called upon to furnish.

£15,440,000 Total.

COST OF WAR.—Up to the end of September the Turco-Italian War cost about **£18,920,000**—£15,440,000 for the Army and £2,480,000 on the Navy. Of this sum about £4,000,000 was used for replenishing arsenals and repairing ships.

MOTOR CENSUS.—A census of all four-wheeled motors will be made in Italy under arrangements decided on by the Minister for War in consultation with the other Ministers.

MACHINE-GUNS.—The present machine-gun, Mod. 906, will be replaced by a gun of a lighter type.

BALKAN OFFICERS TRAINED IN ITALY.—It is stated in the Press that 58 Bulgarian, three Servian, two Greek, and one Montenegrin officers were admitted to the Military Academy between 1887 and 1909, including General Fitcheff.

Italian Colonies.

COLONIAL OFFICE.—A Colonial Office has been created, which will administer the affairs of Tripolitana, Cyrenaica, Erithrea, and Italian Somaliland. Signor Bertolini is appointed the new Colonial Minister.

LIBYA.—The pacification of the country continues, and arms and pistols are being handed in by degrees. Up to November 17th, 5,215 firearms (3,246 rifles) and 327 pistols had been handed in. The importation of arms and ammunition of any kind into any part of Libya has been forbidden.

MOVEMENT OF TROOPS.—A mixed brigade under General Montuori, composed of two Alpini battalions, an Erithrean battalion, the 11th Bersaglieri, the squadron of native cavalry and some mountain artillery, occupied Suani Ben Adam, 20 miles south of Tripoli, on the 15th ult., and Aziziah on the 16th ult. There was no opposition, and General Ragni and his staff motored out from Tripoli, and arrived there at 10.30 a.m. on the latter day.

MEXICO.

The result of the ineffective revolt at Vera Cruz, led by Felix Diaz, nephew of the ex-President, has been that two officers have been tried and shot, while Diaz and his second-in-command are awaiting the decision of the supreme court as to their fate.

In northern Mexico the revolution appears to be declining, and from Mexico city it is reported that the Zapatists have been decisively defeated

near Cuernavaca. The success of the revolution is no longer to be feared, and the larger towns may now be considered safe from attack, but villages and farms over a large area in the States of Durango, Coahuila and Chihuahua are exposed to raids by small bands of brigands at almost any moment, and do not receive effective protection from the Government forces.

The break-up of the rebel forces appears to have increased rather than diminished the danger to private life and property.

Intervention by the United States is not to be apprehended, at any rate, in the near future. The States seem likely to allow events to take their course in the belief that their position will thus be stronger and their task easier should intervention ultimately become necessary. It is thought that a final settlement of the Mexican situation will depend on the success of a new movement under a strong man, or in the succession to the Presidency of a more capable man than Madero.

NICARAGUA.

The revolutionists are dispersed and discredited. Mena, their nominal leader, is in hospital at Ancon, in the Panama Canal zone; and Zeledon, who would probably have supplanted him as President, is dead. The elections were supervized by the United States Government, who do not object to the new President, Diaz, who is a civilian without military ambitions.

It would appear that Nicaragua has had enough of civil war, and the rumours of a general uprising of the Central American Republics against the influence, financial and otherwise, of the United States, seem to have died down.

PERSIA.

TRANS-PERSIAN RAILWAY.—Reuter's agency understands that the International Société d'Etudes in connection with the proposed trans-Persian railway contemplates despatching to Persia at an early date representatives of the various interests concerned for the purpose of negotiating with the Persian Government for a concession for the line.

RAILWAYS.—It is understood that negotiations are in progress with the Persian Government, as regards the following railway concessions:—

(*a*) British—for the proposed Mohammerah—Khoremabad railway; and

(*b*) Russian—for the proposed Julfa—Tabriz—Urmiah line.

GENERAL STATE.—The general state of Persia shows little improvement. An officer of the 27th Punjabis, while travelling from Ahwaz to Isfahan, was set upon by robbers, beaten and stripped of his possessions. His orderly was wounded and has since died. The Regent is still in Europe. Saad-ud-Dauleh arrived at Tehran on 9th November. He is understood to be a candidate for the Premiership. The appointment of a new Medjliss is still in abeyance.

TURCO-PERSIAN FRONTIER.—According to the Press, at the request of the Persian Government, the Porte has consented to delay the Turco-Persian frontier negotiations for another three months, and to withdraw the Turkish troops from the contested zone. The Turks are reported to have withdrawn their troops from the disputed frontier.

SHAHSEVANS.—According to the Press, the Shahsevan leaders have arrived at Tabriz to express their submission to the Russians. The Alartzis are the only tribe which has not yet sent representatives.

RUSSIA.

THE BUDGET OF 1912.—The Budget as finally approved by the Legislature and the Tsar showed a total expenditure of £316,012,000.

Ordinary revenue, £304,902,000; ordinary expenditure, £281,046,000; excess of ordinary revenue, £23,856,000. Extraordinary revenue and free cash in the Treasury, £11,110,000; grand total, £316,012,000.

The extraordinary expenditure amounts to £34,945,000. The chief items are:—Renewal of war stores and material, £7,318,000; railway construction (in Asia), £11,601,000; liquidation of State debt, £15,700,000.

No new loans are required, and the result is generally satisfactory in view of the poor harvest last year. The most remarkable increase is in the vote for the Ministry of Public Education, £18,365,203. The sum originally demanded was £2,634,532 greater than in 1911, and this was further increased by £584,672 in the revised Budget.

The vote for the Ministry of war is £51,894,000.

In the original estimates this vote stood at £77,234,063, an increase of £1,815,000, but £213,371 was struck out, mainly from the Intendance vote, so that the actual increase over last year in the Military Budget is £1,079,000.

THE ESTIMATES FOR 1913.—The ordinary revenue for 1913 is estimated at £333,593,982, an increase of £28,697,217 from 1912. A large portion of this increase, about £14,000,000 is due to the increasing profit derived from Government railways, and another £4,000,000 is expected from the Warsaw—Vienna railway, lately taken over by the Government.

The ordinary expenditure is estimated at £314,503,600, an increase of £33,552,563 compared with 1912. The largest increases are of over £7,000,000 in the Navy Estimates, £5,500,000 in the Army Estimates, and £7,500,000 in the estimates of the Minister of Communications (mainly for railways).

The extraordinary expenditure amounts to £23,223,448. Railway construction requires about £12,000,000, Military expenses over £9,000,000, and harbour construction £2,000,000 of the above total, the two latter items being mainly responsible for the increase of nearly £4,000,000 in extraordinary expenditure as compared with 1912.

The deficit of some £3,000,000 between the grand total of revenue and expenditure (ordinary and extraordinary) will be drawn from the cash balance of the Imperial Treasury, which amounts to over £50,000,000.

RUSSO-TURKISH WAR INDEMNITY.—The question of the payment of interest by Turkey on indemnities due to Russian subjects for damages in 1877, the instalments of which were 20 years in arrear, has been decided by the Hague tribunal, who admitted Russia's claim to interest, but absolved Turkey from payment of it owing to certain formalities having been neglected by the Russian authorities.

CHINA AND MONGOLIA.—The action of Russia in recognising the autonomy of Mongolia has raised a storm of indignation in China, and the despatch of a punitive expedition to Mongolia, and even war with Russia, if she interferes, is being demanded in the Press.

The provisions of the treaty signed at Urga on 3rd November are the recognition by Russia of the autonomy of Mongolia (no definition being given as to what territory is included under that term), and the grant in return to Russian subjects of exclusive trading rights and privileges. These latter include permission to possess land and to establish a postal service.

A force of the Verkhne-Udinski Cossacks has been despatched to Urga.

Although it is unlikely that China will provoke an open conflict with Russia, it seems probable that popular opinion may compel the Government to take military measures to reduce the Mongols to subjection, in which case a serious situation would arise.

ESPIONAGE TRIALS.—Lieutenant Dahm of the German Army was tried at Warsaw on a charge of espionage, convicted, and sentenced to five years' penal servitude. Directly after the trial he was released on bail.

A few days later Captain Kostevich of the Russian Army surrendered from bail and was tried at Berlin on a charge of attempted espionage and sentenced to two years' detention in a fortress; he too was released. The *Novoe Vremya* expresses indignation at this exchange on the grounds that Dahm was successful whereas Kostevich failed to get any information.

DISCIPLINE.—Private Bakurin of the 2nd Sofiski Regiment, who stepped out of the ranks at the review at Moscow to hand a petition to the Czar, was sentenced by court-martial to penal servitude for life. He has, however, been pardoned by the Czar, "in thankfulness for the restoration of the health of the Tzarevitch," and transferred to another regiment.

MILITARY PREPARATIONS.—Army Order 604 of 21st November notifies the Tsar's wish that measures be taken to stop gossip in the army on the subject of Russian military preparations in connection with the Balkan War, and officers and others are warned that they will be liable to dismissal for spreading rumours.

OBITUARY.—Lieutenant-General F. A. Shostak, commanding the Trans-Caspian province and the 2nd Turkistan Army Corps, died on 16th November.

SPAIN.

POLITICAL NEWS.—The Franco-Spanish Treaty was initialled by the French Ambassador and the Minister of State on November 14th in Madrid.

An end has thus been made to a difficult situation between France and Spain.

Spanish North Africa.

GENERAL SITUATION.—The Spanish zone may be divided into three parts—

(1) The Riff and its Hinterland to the new frontier, from Tetuan to the mouth of the Muluya with Melilla.

(2) The Bajalato of Tetuan with the harbour of Ceuta now under construction.

(3) The Spanish Gharb, with Alcazar and Port Larache.

In (1) the Spanish occupation is confined to a circle of about 20 miles round Melilla. In (2) a gradual occupation of small but important mili-

tary posts has been successful, and a motor car service runs regularly from Ceuta to Tetuan.

In (3) the 6,000 Spanish troops have reached Arzila without firing a shot. The only part of the Spanish zone which may repay a policy of commercial penetration is that surrounding the international zone of Tangier.

RETURN OF TROOPS.—Two squadrons of cavalry and two battalions of infantry have returned from Melilla to Spain.

AERONAUTICAL NOTES.

BRITISH EMPIRE.

Australia.

In conjunction with the War Office, the Australian Government have ordered from the Bristol Company two biplanes of the "B.E." type, a number of which the company have at present under construction for the British War Office.

FRANCE.

DIRIGIBLES.—The dirigible "Adjutant Vincenot" was wrecked on November 5th when landing after a trip. The gas-bag was torn to ribbons and the propellers and the car were broken, and the engines were damaged.

A new dirigible has been completed by the Zodiac Co., "Le Spiess," and is a new departure, being of the rigid type. The capacity is 11,000 cubic metres. The rigidity of the body is obtained by wood and not aluminium, as is the case with the German dirigibles. The body is divided into eleven compartments. It is 104 metres long and its greatest diameter is 13½ metres.

The dirigible is driven by two to six-cylindered "Chenu" motors of 180-200 h.p., which actuate two propellers, each of four metres diameter.

The estimated speed is 65 kilometres an hour.

NATIONAL AIRCRAFT FUND.—The national subscription of £130,000 has provided for 116 aeroplanes for the Army and Navy. In addition, the committee is providing for the aeronautical education of 32 men whose term of service is approaching, and also for the aeronautical education of four St. Cyr students and three students of the Polytechnic School. The committee are also to provide 32 landing grounds in the north and east of France. The object at which the committee at present aims is to provide a pilot for each aeroplane given to the nation, and also to establish funds in certain places to endow the aeronautical education of a certain number of pilots annually.

AEROPLANES IN MAROCCO.—The Blériot escadrille has been very active. On November 9th, the distance covered by the whole group was 437 miles.

Among notable individual flights are those of Commandant Felix, from Fez to Rabat (88 miles); of Lieutenant Dohu, from Casablanca to Marrakesh, which was covered in two hours, and from Casablanca to Rabat (75 miles); and of Sergeant Peretti, who carried out a patrol of 187 miles from Casablanca.

GERMANY.

SIEMENS-SCHUCKERT AIRSHIP.—This airship, which was taken over by the military authorities on July 15th, has been altered with a view to amalgamating her system with that of the "Gross" dirigibles. She made an ascent at the beginning of the month from her shed in Mannheim.

THE "P.L. 6."—The "P.L. 6," now known as the "Stollwerck," has completed about 300 journeys.

REPORTED FLIGHT BY A ZEPPELIN AIRSHIP OVER SHEERNESS.—Some sensation was caused in England by the report that an airship, supposed to be German, had, during the night of October 14th-15th, passed over Sheerness. From information published as to the positions of the various German airships on the date in question, it seems scarcely possible that this can have been a German airship.

NATIONAL AVIATION FUND.—A sum of £300,000 had been collected at the end of November, 1912.

AIRSHIP SHEDS.—The Zeppelin company are building a shed at Wildpark, near Potsdam, capable of holding two airships.

REGULATIONS FOR MILITARY AVIATORS.—The military authorities have issued orders that no officer is to go as a passenger in a new type of aeroplane, which has not been fully proved, without first obtaining permission from the General Officer Commanding, who will make the necessary enquiries before granting the same.

ORDERS FOR AEROPLANES.—The Press reports that orders have recently been given for 50 aeroplanes. Preference is said to be given to the "Taube" shape. The motors must develop from 80 to 100 h.p.

NUMBER OF AEROPLANES.—Germany is said to possess some 250 aeroplanes, of which 120 are of the latest make and pattern.

ITALY.

AVIATION COURSE FOR PILOTS.—On January 1st, 1913, a course for pilots will begin under the direction of the aviation battalion.

The course will be in three parts—(i) theoretical instruction at Turin lasting about three months; (ii) practical instruction until candidates are nominated as recruit pilots at the camp schools; (iii) final instruction at the camp schools and at the stations of air squads, until nominated pilots. The second and third periods should not last more than 12 months. Fifty officers with at least five years' service if captains, or two years if lieutenants, are chosen for the first period of the course. Before the third period begins, the numbers should be reduced to 35. Preference is given in the selection of officers for the course to those not weighing more than 11 stone 11 lbs., who are bachelors, who have most knowledge of motors, aviation, and meteorology and mechanics, with experience in office work, and who have distinguished themselves in various sports.

HYDRO-AEROPLANES.—The Minister of Marine has prepared a scheme for establishing a chain of hydro-aeroplanes round the coast of Italy. The proposed cost is from £240,000 to £280,000. A flying school for training the necessary personnel will be established at Venice, where a naval airship school already exists. There will be about 17 stations, from 90 to 125 miles apart, at each of which there will be a flight of four aero-

planes. To enable a concentration of forces to be effected, each station will have eight hangars.

PURCHASE OF AEROPLANES.—Tenders are being invited for the supply of 28 Bristol aeroplanes, with 80 h.p. motors. The conditions demand the provision of Italian machines built in Italy, but the motors may be imported.

RUSSIA.

AEROPLANES.—On October 29th a new aeroplane of Farman type, constructed by subscriptions from the employés of the N.W. Railways was formally presented to the Government and christened "No. 6 National."

The Russo-Baltic wagon factory has completed the construction of a new aeroplane, "Sikorski 5 A," with a 50 h.p. Gnome engine.

It is reported that the Committee for strengthening the Fleet, purchased four monoplanes at the Paris Exhibition.

The new buildings of the officers flying school at Katcha, which belongs to the Committee, were formally opened by the Grand Duke Alexander on the 22nd November.

The Turkestan Aero Club have opened an officers' school at Tashkent.

DIRIGIBLES.—The new military dirigible "Albatross," the largest of the Russian air fleet, has been completed. It carries a machine-gun, a wireless installation, and has two 100 h.p. motors.

It is reported in the Press that the Ministry of War has decided to order three large dirigibles of foreign manufacture, one "Astra," one "Clement-Bayard," and one "Parseval." The last-named is said to be ready for delivery, having been originally intended for the Italians in Tripoli.

SPAIN.

AVIATION TESTS.—Preliminary tests of officers were held at the Aeronautical Headquarters of Guadalajara and Cuatro Vientos, between October 1st and November 10th. Officers taking part had to fulfil the following conditions:—(*a*) To be not over 30 years of age; (*b*) to pass a strict medical examination.

The officers were to be classed:—

(i) Fit to enter the aviation school as pilots.
(ii) Fit for observers but not for pilots.
(iii) Unfit for either (i) or (ii).

Of the officers tested five were taken from the engineers and ten from the other arms.

NOTICES OF BOOKS.

Two Pamphlets. By Colonel Sir Lonsdale Hale. Love & Malcomson, Ltd., Holborn. Price twopence.

I.

THE HORRORS OF WAR IN GREAT BRITAIN.

In the above, Sir Lonsdale Hale, with his usual ability, has addressed himself to the minority of our countrymen who, indifferent to country, and trusting to the solidarity of international labour, say, "if these

islands be conquered, we shall be no worse off than we are now"; and to the great majority who, under the atrophy of ignorance, think that, somehow, all will be well.

He dwells on what is meant by "living on the country" that is invaded, under the method of "subsistence by requisition"; and he shows what the system leads to, and how neglect to obey, is visited on the civil population ordered to surrender their food supplies.

How any form of resistance, active or passive, is repressed by terrorizing the population, if any move a finger against the invader, or in favour of their own countrymen.

How the invader obtains forced labour from the invaded, for any purposes, including the making of defences and other works, by compulsory employment of the population.

How, by the use of money requisitions, those who withhold food, etc., or have none, are made to contribute to the enemy's war chest, even if they starve.

How active resistance is repressed, by the burning of villages and by the "utmost severity" against the passive resisters. While, if active resistance is supported, indulged in, or screened, the instant punishment of death may follow.

Sir Lonsdale Hale quotes the regulations of the invader in France in 1870-71; and, with his intimate knowledge of the history of that war, he gives actual examples of how the business was worked; and what the invaded suffered.

This will be found on pages 6 to 16; and includes von Moltke's letter of 8th December, 1870, to von Werder as to "a hostile attitude of the population," when the following occurs:—

"There can be recommended to your Excellency only the severest treatment to the offenders, as to their lives and property, so that the whole communities are to be regarded as liable for the actions of individual members who cannot be discovered."

Sir Lonsdale ends by recommending "continuous and effective compulsory training" for Britain. The events of the last month confirm his views, and show that, without it, we must presently go to our doom, because Britain is wanted by others on account of its strategical position; and for the possession of its world-wide Empire.

At present, as the expeditionary force is our only military asset, if we send it away to Europe, to maintain the balance of power there, or elsewhere, for imperial ends, our ending may come more tragically and sooner at home. On the other hand, if we do not maintain the balance of power in Europe, our ending, if more remote, is not less sure.

The moral seems to be, that we want enough land force, as perfectly disciplined, trained, and equipped for war, as those of all possible enemies, for home defence, for intervention in Europe, and to secure our Empire on land, with the support of the Colonial nations, which, with us, compose it.

The author clearly shows that we are not in such a position. That was the easiest part of his task.

He deals, on pages 13 and 14, conclusively with the arguments recently put forward to prove the military reliability of the Territorial Force, namely, that the Boer Army was composed of farmers—so, for that matter, are the armies of Bulgaria and Servia to-day—and that the Boers often beat our regular troops. So did the Chouans beat Hoche for a time.

Sir Lonsdale points out that these Boer farmers were nothing less than a trained nation in arms, with, "not 15 years, but with a century and a half of military history behind them"; and fighting in their own country.—T.F.

II.

AWAKE, YOU BRITISHERS, TO YOUR PERIL FROM OVER-THE-WAY, AND HASTEN TO FACE IT.

Sir Lonsdale Hale begins with the remark "Moreover, our Government, to whatever political party they may belong, are more or less opportunists, and they are unwilling to initiate or even to propose any measures they think to be distasteful to their supporters in the constituencies."

He deals with the expansive forces that are pushing on the greatest military power of to-day, and points to the effects on our military position on land and sea, should those forces lead to the annexation of the great Continental ports from the Hague to Bordeaux.

He then indicates our unpreparedness on land, and the widespread and almost universal apathy that, with blind eyes, is content it should be so; because, unlike other nations, who know the horrors of invasion, we have not enough imagination to conceive them.

Apart from the political opportunism that silences the voices of most parliamentary leaders, he, unless I misunderstand him, thinks that there is not room, in the face of the immediate danger, for questions of Imperial defence (see pages 6 and 7). The writer of this appreciation cannot, with all deference, agree with this; both home and Imperial defence are, alike, essential for the security of the heart of the Empire, and of the Empire which, without the heart, must die.

Nor, again, is he quite in accord with Sir Lonsdale's condemnation of the military leaders at the War Office, for thinking "that the true defence lies in assuming the offensive." That, so far as the writer knows, is the opinion of all soldiers who have studied war, in war and in peace. With, however, the proviso that, in our case, we must have the necessary thoroughly trained force, for the offensive abroad, and the defensive at home. Still, a general offensive is the only successful war policy in the long run.

Surely our dilemma is, that unless we can substantially help the maintenance of the balance of power in Europe, on land, as Wellington did early last century, we shall find ourselves without allies; continental Europe will pass into the hands of the strongest, as in Napoleon's days; and, without the immense naval preponderance we then had, as compared with our comparatively weaker naval position now—a position we cannot reverse, without leaving Britain and our Empire, defenceless on land—we may, unless we become a nation in arms, find ourselves among the second-rate powers; or worse still, the slaves of the universal ruler, and the conscript agents of his will. The time has come when we must adopt universal service to hold our Empire, or give our blood to augment the power of our conquerors. Our only choice is to be the conscripts of our own cause, or that of our would-be masters.

The educational value of both of Sir Lonsdale's pamphlets is very great; written, as they are, at once, with much ability, and knowledge. Because the enlightening of the country is the essential and first step

towards national safety. The question must rest ultimately with the governed, not with their governors, who have mostly, so far, failed them.

The decision cannot be postponed.—T.F.

The Naval Annual, 1912. Edited by Viscount Hythe, D.C.L., A.I.N.A. Portsmouth, 1912. J. Griffin & Co.

Brassey's *Naval Annual* is so well known that it requires little introduction, and the edition for 1912 is fully up to its usual standard of utility and interest. It is stated in the preface that the editor had serious thoughts of discontinuing its publication, but fortunately he has been dissuaded from taking such a step. The disappearance of the *Naval Annual* would leave a regretable blank in periodical naval literature.

In addition to the usual chapters on the progress of British and foreign navies, the tabulated lists and plans of the world's warships, the naval estimates of the Powers, and the review of armour and ordnance, which are customary features of the volume, it contains articles by such well-known authorities as Earl Brassey, Sir William White, Mr. John Leyland, Commander C. N. Robinson, and Mr. Alex. Richardson. Lord Brassey contributes a thoughtful chapter on naval administration, of special interest as dealing with the manning problem. Comparisons of strength now-a-days by the so-called naval experts of the press are apt to consider ships and guns only, ignoring the even more important question of personnel. Of what use are "Dreadnoughts" without an adequate supply of trained men to man them? Increases in the number of vessels available, as our politicians well know, catch the public eye, and look more imposing on paper than additions to the human elements of the Fleet, with the result that everything is sacrificed to material. Though, happily, there is no difficulty in obtaining recruits for the Navy, it should not be forgotten that it takes some four years to train a seaman up to present-day requirements, and it is vitally necessary to look far ahead in the entry of ratings for the Fleet. The question of reserves, with which Lord Brassey deals, is of considerable importance. A curious error occurs in this chapter, where on page 8 the old battleships "Nile" and "Trafalgar," which were, in fact, launched in 1888 and 1887 respectively, are referred to as having been completed in 1900.

Mr. Richardson has written the chapter on Machinery Problems in High-Powered Warships. The increased use of oil fuel, and the advent of the internal combustion engine now used in submarines for propulsion, and in large ships for auxiliary machinery, have brought fresh factors into the engine room.

The new Naval War Staff is described in the First Lord's statement, and compared with the war staffs of foreign Powers by Mr. Leyland. Its establishment has, on the whole, been received with approval in the Service, but it is too early as yet for any criticism of its working to be possible.

An exhaustive description, by Sir William White, of the "Dreadnought" and "super-Dreadnought" types of ship, and a comparison of them with their predecessors, deserves the attention of all naval officers. Sir William criticizes the modern policy of putting so many eggs in one basket, as represented by the construction of these enormous vessels, costing as much as two millions sterling to build and equip. This is a matter on which experts differ, and the views of so eminent a naval architect cannot be read without respect.

The final chapter of Part I. is a historical account by Commander Robinson of the naval operations in the Turco-Italian War, a conflict which has once again emphasized the value of sea power, though the small size and inefficiency of the Turkish fleet rendered the actual operations somewhat trivial.—J.T.T.

History of the 16th (The Queen's) Lancers.—Printed by George Simpson, Devizes.

The latest addition to the now fairly long list of Regimental Histories is that of the 16th (the Queen's) Lancers.

It is a handsome volume, the work of Colonel Henry Graham, who in its pages narrates the services abroad and at home of his old regiment. The work is issued as privately printed, and may be assumed therefore to be limited in edition and not designed to appeal to the general public.

The history starts with the raising of the regiment in 1759. The officer to whom the task was committed was Lieut.-Colonel (afterwards General) John Burgoyne. The "letter of service" was dated August 4th, in that year. There is, however, in existence another private, though official, letter written to Burgoyne, in which he is given permission to raise this regiment of Light Dragoons after his own particular plan. This letter is not, however, quoted, though that there were differences in the establishment of the regiment from that of its predecessor, the 15th (Elliot's) is certain.

The 16th, the second of the regiments of Light Cavalry in seniority, first saw service at Belleisle in 1761, and this was followed by a campaign in Portugal, where, under Burgoyne's able leadership, the regiment distinguished itself. After a period of home service extending over 13 years the 16th was ordered to America to take part in the War of Independence. The campaign closed in 1781, and the regiment again returned home. In the French War of 1793 the 16th served under the Duke of York—at least, four troops accompanied that commander. Plenty of fighting fell to their share during the campaign, which lasted for three years. Next came the Peninsular War, and from 1809 the 16th were continuously engaged. Their services in this momentous campaign are well recorded by their historian. At Waterloo more honours accrued to the regiment.

From 1823 to 1846 they served in India, where six honours were added to those already gained by them. After being stationed for the second time in India the 16th was ordered to South Africa, and took their share in the fighting and toilsome travelling of the Boer War. In appendices the changes in the uniform of the regiment and the variations in arms and equipment are given with care and great minuteness. Sporting records are not neglected, and some account of the valuable presentation plate and trophies of sport is inserted. Many useful maps are scattered through the volume, and the illustrations, both in "three-colour" and "half-tone," are numerous.

The register of officers might have included the life-stories of majors, captains, lieutenants, and cornets, as well as those of the senior ranks. We have not tested the particulars set forth as to the services of the colonels beyond the first one, General John Burgoyne, who raised the regiment. In this, one important detail is, however, wanting, namely, his seven years' exile on the Continent when, after quitting the service as captain, he employed his time in studying the systems, methods, and equipments of Light Cavalry in foreign lands.—A.L.

FOREIGN PERIODICALS.

NAVAL.

AUSTRIA-HUNGARY.

MITTEILUNGEN AUS DEM GEBIETE DES SEEWESENS. Pola: **No. 12, 1912.** —The French Naval Manœuvres in the North in 1912. The Austro-Hungarian Naval Budget for 1912. New electric apparatus for warships. The Dutch Naval Estimates for 1913. The hydro-aeroplane competition.

FRANCE.

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LE YACHT. Paris: **2nd November, 1912.**—The evolution of strategical ideas. **9th November.**—The increase of tonnage. A treatise on the employment of chains and anchors. Stations of French ships on the 1st October. **16th November.**—Diesel motor engines on board submarines. The launch of the battleship "France." **23rd November.**—Electric propulsion of ships. **30th November.**—The Austrian Battleship "Viribus Unitis." The tonnage of submarines. Treatise on the employment of anchors and chains.

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---

*—to be continued. †—continued. §—concluded.

GERMANY.

MARINE RUNDSCHAU. Berlin: **November, 1912.**—Frontispiece: The Austro-Hungarian Dreadnought "Viribus Unitis." Geographical and strategical reflections on the situation of the Balkan States (by General Imhoff). The Balkan war. Moltke. Coast defence in the United States. A new view of the Indian problem. Causes of accidents on board ship (statistical). The British Parliament. The Turco-Italian War, 1911-12.

ITALY.

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MILITARY.

AUSTRIA-HUNGARY.

STREFFLEURS MILITÄRISCHE ZEITSCHRIFT. Vienna: **September, 1912.**—The Military Service Law of Bosnia and Herzegovina. Italy and Tripoli. The French operations in Marocco. **October.**—The auxiliary corps under Schwarzenberg in 1812. The Military Service Law of 1912 explained.* Tripolitana. Austrian cyclist troops. Railway construction in Turkey.

FRANCE.

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*—to be continued. †—continued. §—concluded.

coast defence), by Admiral Bienaimé. Remarks on the defence of Port Arthur by General Grandprey. A treatise on the supply services of armies. Treatise on the infantry combat. Comments on M. Renaud's article on the American Army. The manœuvres of the Greek Army in 1912.

GERMANY.

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UNITED STATES.

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*—to be continued. †—continued. §—concluded.

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INDEX.

JULY TO DECEMBER, 1912.

PAGE

ACTION of Tide-generating Force (Capt. J. Ruthven) ... 1772
AUSTRIAN Army Bill, The new 1314
BROCK, Sir Isaac; the Hero of Upper Canada (Major-General C. W. Robinson) 1547
CASE for the Eight Company Battalion, The (Capt. Kentish, Royal Irish Fusiliers) 891
COAST Fortresses on Naval Strategy, The Influence of (Lieut.-Colonel W. James, R.A.) 1223, 1367
COLLECTIVE Fire (Capt. L. H. Tudor, S. Wales Borderers) ... 1021
CORRUGATED Ship, The (Capt. G. S. MacIlwaine, R.N.) ... 1518
COURTS Martial of the Peninsular War, 1809-14 (Prof. Oman) 1699
DEVELOPMENT of Sailing Ship Tactics compared to that of Steam Tactics, with a Glance into the Future. (Trans. by Korvetten Kapitän Emil Wilde, Austro-Hungarian Navy 1263, 1423
DISEASE Afloat, some environmental factors in relation to (Fleet Surgeon C. Marsh-Beadnell, R.N.) 1679
EIGHT Company Battalion, The Case for the (Capt. Kentish, Royal Irish Fusiliers) 891
FOREIGN Armies, Events of year 1911 in (Russia) 957, (U.S.A.) 1131
GERMAN Colonial Policy, Concerning the Aims of (Prof. Hans Delbrück. Trans. by Col. H. Wylly) 1409
GREEN, Sir Henry, and the Sind Frontier (Lieut.-Colonel A. C. Yate, late 129th Bn. (D.C.O.) Baluchis) 1569
HANDLING of Ships in Divisions (Admiral Gaschard), trans. from the *Revue Maritime* 1165, 1440
"HIGHLAND Emigrants" and their Comrades, The (Capt. R. E. Key, York and Lanc. Regt.) 1165
INFANTRY Battalion, A Short Plea in favour of the present organization of the (An Infantry Officer) 1579
LETTERS to George III. from Lieut.-General Viscount Townshend (Charles Dalton) 1419
MILITARY Cryptography (Capt. Muirhead, R.F.A.) 1665
NATIONAL System of Providing the Necessary Military Force, The Best (2nd Prize Essay, Major H. L. Pritchard) ... 1075
NAVAL Problem, The (Admiral Darriens; trans. from *La Ligue Maritime*) 929
NAVAL Strategy, The Influence of Coast Fortresses on (Lieut.-Colonel James, R.A.) 1223, 1367
WAR Dogs, Employment of, with special reference to Tripoli and other recent campaigns (Major Richardson) ... 1649
PENINSULAR Recollections (Cornet Francis Hall) 1389, 1535, 1735
PROFESSION of Arms, The (Capt. Mozeley, R.E.) 1011
RIFLE, The: A Weapon of Precision (Capt. Hardcastle, *p.a.c.*, late R.A.) 973
STRATEGIC Employment of Cavalry, The (Major-General Townshend) 1171
SUPPLY of Ammunition and Motor Transport (Major De Pree) 1149
TERRITORIAL Field Artillery, The value of (Col. E. A. Lambart, late R.A.) 989

PAGE

TIDAL Wave and Current, The (Commander J. F. Ruthven, Commodore Orient Line) 985
VON LÖBELL Reports on Military Matters in 1911 (Colonel E. Gunter) 1557, 1717
WIRELESS Telegraphy and Telephony (*Nauticus*) ... 997, 1121

Authors and Translators.

BEADNELL, Fleet Surgeon C. M. (Some environmental factors in relation to Disease Afloat) 1679
DALTON, Charles, F.R.G.S. (Letters to George III. from Viscount Townshend) 1419
DARRIENS, Admiral (Naval Problem) 929
DE PREE, Major (Supply of Ammunition and Motor Transport) 1149
DELBRÜCK, Professor Hans (Concerning the Aims of German Colonial Policy) 1409
GASCHARD, *Admiral* (Handling of Ships in Divisions) ... 1165
GUNTER, Colonel E. (Von Löbell Reports) 1557, 1717
HALL, Cornet Francis (Peninsular Recollections) 1389, 1535, 1735
HARDCASTLE, Capt. (The Rifle: a Weapon of Precision ... 973
INFANTRY Officer, An (Plea in favour of the present organization of the Infantry Battalion) 1579
JAMES, Lieut.-Colonel (Influence of Coast Fortresses on Naval Strategy) 1223, 1367
KENTISH, Capt. (The case for the Eight Company Battalion) 891
KEY, Capt. R. E., York and Lanc. Regt. (Highland Emigrants and their Comrades) 1247
LAMBART, Colonel E. A. (Value of Territorial Field Artillery) 989
MACILWAINE, Capt. G. S., R.N. (The Corrugated Ship) ... 1518
MOZELEY, Capt. (The Profession of Arms) 1011
MUIRHEAD, Capt. (Military Cryptography) 1665
"NAUTICUS" (Wireless Telegraphy and Telephony) 997, 1121
OMAN, Professor C. W. (Courts Martial of the Peninsular War, 1809-14) 1699
PRITCHARD, Major (2nd Prize Military Essay) 1076
RICHARDSON, Major (The Employment of War Dogs) ... 1649
ROBINSON, Major-General C. W., C.B. (Sir Isaac Brock) ... 1547
RUTHVEN, Capt. (Tidal Wave and Current, and note on Tides) 985, 1772
TUDOR, Capt. (Collective Fire) 1021
TOWNSHEND, Major-General C. V. (Strategical Employment of Cavalry) 1171
WILDE, Korvetten Kapitän Emil (Development of Sailing Ship Tactics) 1263, 1423
YATE, Lieut.-Colonel A. C. (Sir H. Green and Sind Frontier) 1569

Frontispieces.

LANDING of Italian troops at Derna (para. p. 890) facing page 887.
FIELD-MARSHAL Gebhardt Leberecht von Blücher, facing page 1071.
COMBATANTS at Quebec in 1775 (para. p. 1260) facing page 1219.
LORD RODNEY'S victory over De Grasse, 12th April, 1782, facing page 1363.
GENERAL Sir Isaac Brock (para. p. 1547) facing page 1511,
MARSHAL Ney, facing page 1643.

PAGE

Miscellaneous.

OUR Grain Supply through the Mediterranean 1074
UNIVERSAL Training in the Australian Commonwealth ... 1285
HANDLING of Ships in Divisions (Corrections on) 1440
NOTE on Military Cryptography 1568
IMPERIAL Defence 1189
SECRETARY'S Notes ... 887, 1071, 1219, 1363, 1511, 1643
PRINCIPAL Additions to Library 889, 1073, 1221, 1442, 1578, 1647
NAVAL Notes 1030, 1179, 1325, 1443, 1583, 1750
MILITARY Notes 1040, 1191, 1334, 1453, 1539, 1763
AERONAUTICAL Notes ... 1059, 1201, 1348, 1484, 1611, 1775
NAVAL and Military Calendar 1039, 1200, 1352, 1483, 1635, 1664
NOTICES of Books ... 1062, 1211, 1353, 1506, 1636, 1777
CONTENTS of Foreign Periodicals 1068, 1216, 1359, 1507, 1640, 1782
IMPORTANT Naval and Military Literature 1066, 1214, 1356, 1638

INDEX TO SMALL PRINT MATTER.

(CHIEF HEADINGS ONLY.)

War in the Mediterranean.

PAGE

ITALY: *General*:—
Aeroplane Flights ... 1319
Aeroplane Sheds in Aegean ... 1615
Ain Zara, Fort at ... 1026
Army Establishment Increased 1318
Aviator Captured ... 1615
Cable from Tripoli to Syracuse 1319
Caneva, General, Recalled 1318, 1615
Casualties ... 1026, 1616
Commands in Libya ... 1318, 1615
Cost of War ... 1618, 1771
Damages to Aeroplanes ... 1205
Erithrean Battalion Relieved ... 1205
Railway, Tripoli-Zanzur, Opened 1616
Reservists Released ... 1319
Strength of Army in October ... 1618
Treaty of Peace ... 1618

TURKEY: *General*:—
Cost of War ... 1026
Movements of Troops ... 1205, 1615

NAVAL: *Italy*:—
Capture of Farsan Islands ... 1210
Convoys of Troop Transports ... 1205
Fleet occupies Aegean Islands ... 1028
Hodeida Forts Bombarded ... 1319
Landing at Busceifa ... 1028, 1208
Torpedo Raid, Dardanelles ... 1205

LAND OPERATIONS:—
Aegean Islands Occupied ... 1029
Bombah, Occupation of ... 1617
Busceifa, Landing at ... 1028, 1208
Derna, Fighting at ... 1616, 1617
Homs, Attack on ... 1028
Misrata, Fighting near ... 1209, 1614
Regdalin Occupied ... 1615
Sidi Said ... 1026, 1207

PAGE
Tobruk, Attack on ... 1028
Zanzur ... 1027, 1319, 1616
Zuara, Occupation of ... 1614

War in the Balkan Peninsula.

GEOGRAPHY AND COMMUNICATIONS 1491
THE NATIONS IN ARMS (Organization, Armament, etc.) ... 1494
Greek and Turkish Navies ... 1501
DEVELOPMENT OF CRISIS:—
Causes of the dispute ... 1501
Political and Strategical considerations ... 1503
Steps preceding hostilities ... 1620
War Organization ... 1622
NARRATIVE OF OPERATIONS (*from Press Sources*):—
Operations of the Bulgarians 1625, 1740
Operations of the Greeks 1630, 1745
Operations of the Servians 1631, 1744
Operations of the Montenegrins 1633, 1746
Attack on Chatalja ... 1741
Battle of Kirk Kilissa ... 1625
,, ,, Kumanovo ... 1631
,, ,, Sarantoporos ... 1630
,, ,, Lule Burgas ... 1629
,, ,, Marhamli ... 1743
,, ,, Monastir ... 1744
Siege of Adrianople ... 1625, 1742
,, ,, Scutari ... 1633, 1746
Naval Operations ... 1634, 1747
POLITICAL:—
Peace Negotiations ... 1747
Attitude of Neutrals ... 1748
Conclusion of Armistice ... 1749

Naval Notes.

PAGE

BRITISH EMPIRE: *Home* :—
Appointments 1030, 1325, 1443, 1583, 1750
Armoured Ships, 1911-12 1031
" B 2," Loss of 1443
Companionships of the Bath ... 1443
" Conqueror," Steam Trials of 1031
First Cruiser Squadron 1444
Floating Docks 1326, 1584
Flotilla Cruisers 1325
Gun Layer's Test 1032, 1327
Launches 1032, 1585
Malay States, Offer of Ship 1752
Manœuvres 1326
Mediterranean Fleet 1031, 1444
Naval Administration 1445
Naval Manœuvres 1032
Parliamentary Visit to Fleet ... 1179
Promotions to Commissions ... 1444
Wireless and Hydroplane Station 1586

AUSTRALIA :—
Naval Base 1453

CANADA :—
Naval Defence Requirements ... 1753
Offer of Battleships 1757

AUSTRIA-HUNGARY :—
" Viribus Unitis " 1453

FRANCE :—
Appointments ... 1034, 1330, 1586
Beer, Sale of 1331
" Jules Michelet," Accident on 1759
Launch 1590
Manœuvres 1588
Mines 1590
New Ships 1331
Powders, Treatise on 1759
Steam Trials 1758
Submarine Losses 1035
Ultra-Violet Rays in Submarines 1331
" Vendémiaire," Loss of 1034

GERMANY :—
Appointments 1183, 1332
Naval Estimates for 1912 1183
Naval Law Amendment Bill ... 1184
New Naval Law 1332
Personnel of Fleet 1332

HOLLAND :—
Shipping 1760
Wireless Telegraphy 1760

ITALY :—
Report of Navy Minister 1761
Review of Fleet 1760
Steam Trials 1761

JAPAN :—
Naval Construction 1036
Naval Estimates, 1912-13 1035

NORWAY :—
Naval and Coast Defence 1762

PORTUGAL :—
New Navy 1037

RUSSIA :—
Navy Bill 1037
Shipbuilding Bounties 1763

PAGE
Torpedo Range, Theodosia 1763
Trophy of 1854 1763

SERVIA :—
Port on the Danube 1763

UNITED STATES :—
Ammunition Contracts 1763
Heavy Oil Engines 1188
Launch of " Texas" 1038
Pearl Harbour, Hawaii 1763
Review of Fleet 1591
" Wyoming," Trials of 1592

Military Notes.

BRITISH EMPIRE: *Home* :—
Appointments 1334
Horses, Boarded out 1191
Horses, Reserve of 1593
Manœuvres 1453
Military History Examinations 1191
Motor Lorries, Subsidy Scheme 1334
National Reserve, Review of ... 1040
Staff Work, Allocation of 1593
Territorials, Strength of 1763

Afghanistan :—
Afghan Troops 1337
Khost Rising 1337
Railways 1765

Australia :—
Cadet Training 1335, 1461
General Staff Duties 1595
Mobilization Committee 1335
Trans-Australian Railway 1461

Canada :—
British Reservists for Canada ... 1461

Cyprus :—
Movement of Troops 1040, 1596

Egypt :—
Military Attaché Appointed 1596

India :—
Abor Expedition ... 1041, 1192, 1765
Arms Traffic in Persian Gulf ... 1041
Assam 1461
Chinese Troops from Lhasa 1596, 1765
Nicholson Committee 1461, 1596

New Zealand :—
Cadets, Appearance of the 1336
Defence Act, Amendments to ... 1596
Training Camps 1336

South Africa :—
Appointments 1336, 1461
Council of Defence 1461
Defence Bill 1041
Military School 1337

ABYSSINIA :—
Anuak Expedition 1462
Baro Kella Bridge 1462
Dirre Daua Railway 1462
Small Arms Factory 1337

ARGENTINA :—
Army Estimates 1596
Boundary Commission 1597
Establishments 1041, 1597
Officers, Attachment of 1337
Staff Colleges 1041

MILITARY NOTES (contd.)

PAGE

AUSTRIA-HUNGARY :—
Army Bill 1042
Army Estimates, 1913 1766
Bosnia 1042, 1462
Canteen 1462
Croatia 1042
Engineer Troops 1463
Explosion in Magazines 1042
Field Service Regulations 1462
Manœuvres 1042, 1463
Officers' Length of Service ... 1463
Recruit Contingents 1463
Rifle Associations 1042

BELGIUM :—
Appointments 1338
Army Estimates 1766
Army Reorganization 1597, 1766
Belgian Congo Budget 1194
Chief of General Staff 1766
Machine-guns 1597
War Minister Resigns 1766

BRAZIL :—
Army Estimates 1597

BULGARIA :—
Army Estimates 1338
Frontier Collision 1042, 1467
Manœuvres 1467
Military Attaché 1338
Organization 1467
Staff College 1338
War with Turkey (see page v.)

CHILI :—
Census 1338
Chili and Peru 1043
Fortifications 1338
Railways 1043
Rearmament 1043

CHINA :—
Army Organization 1470
Execution of Two Generals ... 1469
Finance 1767
Kashgaria 1339, 1470, 1471
Kwang-Tung Province 1468
Military Adviser 1472
Mongolia 1044, 1470, 1471, 1598, 1773
Movements of Troops 1470
Mutinies of Troops 1043, 1472
Opium 1339, 1599
Portuguese action against pirates 1472
Railways 1044, 1598, 1599, 1767
Review at Peking 1767
Russians, Encounter with 1044
Thibetan Situation 1044, 1472, 1598, 1768
Treaty of 1881 1471

CUBA :—
American Demands 1599
Negro Rising 1045, 1339

FRANCE :—
Anti-Militarism 1473, 1768
Appellations 1340
Army Debate 1045
Budget 1340
Channel Tunnel 1600
Engagements 1473
Government in War 1046
Howitzers, Field 1472
Leagues and Associations 1473
Loi des Cadres 1340
Machine Guns 1473
Manœuvres 1047, 1194
Medical Technical Section 1473
Messing 1340
Promotion 1046
Recruit Contingent 1473
Schools, Engineer & Artillery 1340
Schools, Inspection of 1340
Staff Work, Decentralization of 1600
Time, New System of 1046
Uniforms, New 1340, 1768

Marocco :—
Abdication of Sultan 1473
Attack on Fez 1048
Casablanca, Port of 1770
Changes in Command 1474
French Forces 1196, 1474, 1475, 1476
New Military Divisions 1474
Operations 1049, 1195, 1473, 1474, 1600, 1601, 1769
Reorganization of Army 1050
Reservists for Marocco 1474
Shereefian Troops 1476
Southern Pretender 1473

FRENCH COLONIES :—
Algeria 1048, 1340, 1769
Equatorial Africa 1600, 1769
Guadaloupe 1341
Guineé 1769
Madagascar 1340
West Africa 1048, 1600, 1769
Wireless Telegraphy 1768

GERMANY :—
Army Estimates, 1913 1770
Birth Rate 1051
Changes in Army, 1912-15 1196
Eifel District 1051
Fortifications of Sylt 1476, 1601
Imperial Finance 1341
Machine-gun Shields 1051
Manœuvres 1051, 1196, 1476
Martial Law in Bavaria 1770
Motor Vehicles 1051
New Army Corps 1051
Officers at Naval Manœuvres ... 1341
Pay of Rank and File 1601
Purchase of Rolling Stock 1601
Recruiting Muster 1051
Reseryes, Training of 1051, 1341
Service for Germans Abroad ... 1341
Strategic Railways 1341

GERMAN COLONIES :—
Colonial Medal 1341
Railway Regulations 1601

Cameroons :—
Boundary Commission 1342
Cable 1601
Railways 1342, 1601
Trade 1342

German East Africa :—
Disturbances on Frontier 1341
Heliographs 1602

MILITARY NOTES—(contd.).

PAGE

German East Africa :—
Indian Settlers 1342
Mobilization of Askaris 1602
Railways 1602
Trade 1342
Volunteer Corps 1602

German South-West Africa :—
Boundary Commission 1602
Horses 1602
Hottentot Raid 1602
Railways 1341
Trade 1341
Wireless Telegraphy 1602

Kiao Chao :—
Garrison 1342
Railways 1342
Trade 1342

Togo :—
Financial Development 1342
Trade 1342

Western Pacific :—
Wireless Telegraphy 1602

GREECE :—
Manœvures 1052
Political 1467
War with Turkey (see page v.)

HAITI AND SAN DOMINGO :—
Army Reform 1603

HOLLAND :—
Appointments 1343, 1603
Army Organization 1770
Coast Defence Bill 1343, 1603
Cooking Wagons 1343
Defence Ministry 1603
Disciplinary Depôt 1198
Machine-guns 1603
Militia Contingent for 1913 1603
"National Service League" ... 1343
Telegraphs 1198
Uniform 1770

ITALY :—
Colonies 1054, 1771
Establishments 1318, 1476
Finance 1053, 1771
Libya, Pacification of 1771
Machine-guns 1771
Motor Census 1771
Officers' Education 1053
Officers, Shortage of 1477
Remounts 1603

JAPAN :—
Appointments 1054, 1604
Army Manœuvres, 1912 1604
Carbine with Folding Bayonet... 1477
Cavalry Training Manual 1344
Death of Emperor 1477
Finance and Defence 1054
Korean Garrison 1343, 1603
Pacific, Enterprise in 1054
Purchase of Stallions 1604
Mechanical Transport 1344
North China Garrison 1344

PAGE

Russo-Japanese Negotiations ... 1343
Searchlights, Field 1344
Staff Ride 1477

LIBERIA :—
Frontier Force 1604

MEXICO :—
Rebellion 1054, 1344, 1478, 1605, 1771
War Loan 1605

MONTENEGRO :—
Frontier Troubles 1054, 1468
War with Turkey (see page v.)

NICARAGUA :—
Rebellion 1605, 1772

OTTOMAN EMPIRE :—
Albania 1055, 1345, 1464, 1466
Bulgaria, Relations with 1465
Distribution of Troops 1346
General Situation in August 1464
Montenegrin Fighting 1464
Movements of Troops in August and September, 1912 1466
Mutiny of Troops 1055
Samos 1467
War with Italy and Balkan League (see page v.)

PARAGUAY :—
Government Victory 1055

PERSIA :—
British Troops Landed 1056
Bundar Abbas 1478
Cossack Brigade 1346
Fars 1606
Finance 1478
Gendarmerie 1478
Kerman 1055
Kermanshah 1478
Persian Army 1478
Russian Forces 1055
Russian Operations in Persia ... 1478
Salar-ed-Dowleh 1056, 1346, 1478, 1606
The Shahsevans 1478, 1773
Trans-Persian Railway ... 1056, 1772
Turco-Persian Frontier 1056, 1479, 1772

PORTUGAL :—
Annual Levy 1056
Royalist Invasion 1198, 1606
Wireless Telegraphy 1056, 1607

PORTUGUESE COLONIES :—
Beira 1607
Colonial Troops 1199
Goa 1607
Lourenco Marques 1607
Railways 1199, 1607

RUMANIA :—
Automobile Corps 1468
Recruit Contingent 1468
Uniform 1056

RUSSIA :—
Appointments 1057, 1346, 1479, 1607
Army Estimates, 1913 ..... 1607, 1773
Artillery School 1057
Borodino, Centenary of 1481

MILITARY NOTES. RUSSIA—(contd.).

PAGE

Boy Volunteers 1479
Chief of General Staff 1346
Discipline 1480
Espionage 1774
Field Service Regulations, 1912 1479
Gunnery School 1608
Health of Army 1346
Kashgar Consular Guard 1057
Languages 1479
Manœuvres 1481
Military Academy 1608
Military Service, New Law of ... 1479
Mongolia 1773
Mutiny at Tashkent 1480
New Espionage Law 1481
Railways 1481, 1608
Reservists Training 1057
Restrictions of the Press 1607
Schools, Electro-Technical 1607
Shahsevan Expedition, see Persia.
Trial Mobilization in Siberia ... 1346
War Indemnity 1773

SERVIA :—
Political 1468
Manœuvres 1057
War Material 1057, 1468
War Minister 1057
War with Turkey (see page v.)

SIAM :—
Heavy Guns 1057
Railways 1057
Wireless Telegraphy 1608

SPAIN : —
Artillery Reorganization 1199
Distribution of the Army 1200
Franco-Spanish Treaty 1481, 1601, 1774
Military Expenditure 1057
Railway Strike 1608
Tangier-Fez Railway 1200
Spanish North Africa 1346, 1608, 1774
Wireless Telegraphy 1609

SWEDEN :—
Fortifications 1058
Manœuvres 1058
Mobilization 1058
Small Arms Ammunition 1058

SWITZERLAND :—
Kaiser's Visit 1482
Landsturm Organization 1347
Mountain Artillery Ponies 1482
Mountaineering Feat 1347
Reorganization of Headquarter Staff 1482

URUGUAY :—
Army Estimates 1611
Port Extension 1611

UNITED STATES :—
Army Bill 1483, 1609
Army Organization 1347
Arsenal Burnt 1610
Cavalry, *Rôle* of 1610
Emigration 1058
Fisheries Treaty 1482
Panama Canal Bill 1482

Aeronautical Notes.

PAGE

BRITISH EMPIRE : *Home* :—
Aerial Reconnaissance 1201
Aeroplane Trials on Salisbury Plain 1348
Fatal Accidents 1201, 1484
Flights Along Channel Coast ... 1059
"Gamma," Accident to 1059
Height Record, Army Biplane 1349
Hydro-aeroplane 1059
Man Lifting Kites 1349
Military Value of Aircraft 1484
New Biplane 1349
Royal Flying Corps, Pay of ... 1350
Royal Flying School 1351

Australia— :
Bristol Biplanes Purchased 1775

ARGENTINA :—
Aviation 1351, 1611

AUSTRIA-HUNGARY :—
Aeroplanes, Purchase of 1059
Air Fleet Committee 1201
Hydroplane 1611
Training Courses 1059

FRANCE :—
"Adjutant Vincenot" Wrecked 1775
Aeronautics at Manœuvres 1487
Aeroplanes in Marocco 1775
Bomb Dropping 1202, 1488
Clement Bayard III. 1202
Dirigible Height Record 1060
Effects of Fire at Aircraft 1488
Farman Folding Aeroplane 1488
Grand Prix Race 1060
L'aeronautique Militaire 1487
National Aircraft Fund 1487, 1611, 1775
New Dirigibles 1488
Parachutes for Aeroplanes 1611
Pilots, Number of 1202, 1487
Record Flights 1488
Sheds for Dirigibles 1612
Stabilisateur 1611
Test of Aeroplane Material 1060
Wireless Telegraphy from Aeroplanes 1488

GERMANY :—
Aerial Postal Service 1612
Aeroplanes for Navy 1061
Aeroplanes, Number of 1776
"Airship Law," Suggested 1489
Anti-Balloon Guns 1489
Aviation Fund 1061
Aviation in the Colonies 1490
Aviation Stations on Frontier ... 1351
Aviators, Regulations for 1776
Bomb Dropping 1489, 1613
Destruction of "Schwaben" ... 1060
Dirigible Flights ... 1060, 1202, 1351, 1489, 1612, 1776
Dirigibles at the Manœuvres ... 1489
Dirigible Sheds 1489, 1776
Etrich "Air Coach" 1061
Flying Meeting at Johannisthal 1490

AERO NOTES. GERMANY—(contd.).

PAGE

Flying Troops and Recruits ... 1612
Fuel for Dirigibles 1612
Hydro-Aeroplane Meeting 1489
Machine Guns on Dirigibles ... 1612
"M" Dirigibles, Accidents to 1612
Meteorological Bureau 1061
National Aircraft Subscription 1488, 1776
Naval Aeronautical Competition 1489
Naval Dirigible 1488
Naval Dirigible "L 1" 1612
Naval Flying Officers 1488
New Zeppelin Dirigible 1489
One-Year Volunteers as Aviators 1351
Pilots, Number of 1351, 1612
Volunteer Corps of Airmen 1490

GREECE :—
Aviation 1204

HOLLAND :—
Aviation 1613
Purchase of Material 1351

ITALY :—
Aeroplanes, Purchase of 1777
Aviation Course for Pilots 1776
Dirigible "M 1" 1061
Hydro-Aeroplanes 1776

PAGE

JAPAN :—
Parseval Airship 1352
Training of Officers 1352

NORWAY :—
Purchase of Material 1352

OTTOMAN EMPIRE :—
Aeroplanes 1490
Pilots 1490

RUSSIA :—
Aeroplane Competition 1613
Aeroplane Section of General Staff 1613
Aeroplanes 1062, 1777
Dirigibles 1777
Flying School 1613
Personnel 1061
Reconnaissances 1352

SPAIN :—
Aviation Tests 1777

SWEDEN :—
Training of Officers 1613

UNITED STATES :—
Aeroplane Gun 1062
Purchase of Aeroplanes 1062
Loss of "Akron" 1204
War Biplane 1062

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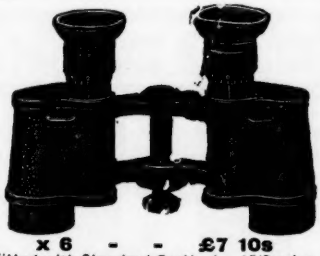

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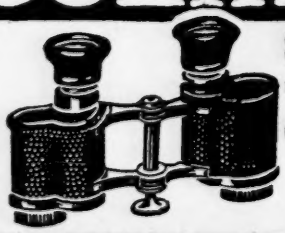

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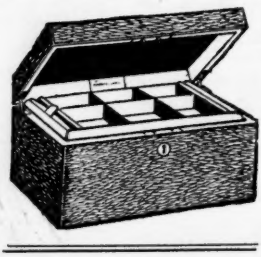

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